Volume 9 Number 1
June 2012
Indexed in Western Pacific Region Indicus Medicus (WPRIM), WHO

MONGOLIAN JOURNAL OF HEALTH SCIENCES

Biomedicine
Dentistry
Health Technology
Medicine
Pharmacy
Public Health
Traditional Medicine

Mongolian Journal of Health Sciences

Volume 9 Number 1
June 2012

CONTENTS

MESSAGE FROM THE EDITOR-IN-CHIEF

DEAR READERS,

This issue is dedicated to the hundreds of qualified medical professionals, academic staff, graduate students and others, who are loyal readers and contributors.

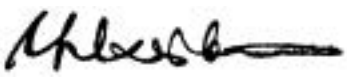
Each year in this space we offer our heartfelt thanks to the volunteer peer viewers who help ensure the quality and integrity of the Mongolian Journal of Health Sciences. We simply couldn't be successful in our jobs as editors without their continued dedication and commitment to the scientific community.

Many of young promising medical scientists are successfully working in the modern scientific laboratories and research institutes of Mongolia as well as those of developed countries. Their research results are sited and published at the internationally recognized journals with high impact factor.

Therefore, one of the goals of Mongolian Journal of Health Sciences is to disseminate and share our accumulated research achievements and experiences with international research colleagues and scholars.

All the best wishes to the dear readers of Mongolian Journal of Health Sciences!

Editor-in-Chief



Academician, Professor Ts. Lkhagvasuren (M.D., Ph.D., D.Sc.)

MONGOLIAN JOURNAL OF HEALTH SCIENCES

The Mongolian Journal of Health Sciences was founded in 2003 to provide a means for the interchange of ideas among Mongolian medical professionals and foreign countries to advance the skill and knowledge of health sciences, based on a peer review process by the foremost authorities in all health sciences. The Mongolian Journal of Health Sciences will continue to provide information for the standard for health care.

The Mongolian Journal of Health Sciences is published by the Health Sciences University of Mongolia (HSUM) twice a year in English. The Editorial Board welcomes contributions in the form of original research reports, review articles, brief communications, case reports, commentaries, clinical practice materials, and letters to the editor, medical memoranda in all fields of Health Sciences. The Journal also publishes review of books and audiovisual materials, and other (medical) educational materials; socioeconomic, political and legal matters related to medical practice; conference and workshop reports and other categories including medical news.

The HSUM welcomes requests for permission to reproduce or translate its publications, in part or in full. Manuscripts (three copies of manuscripts, tables, figures, etc.) as well as books for review, notices of conferences, and news of importance, should be sent with a covering letter to the editorial office.

Editorial address: Health Sciences University of Mongolia
P. O. 48 Box 111,
Ulaanbaatar 210648, Mongolia
Fax: (976)-11-321249
E-mail: davaalham@yahoo.com

Printed by “Erhes” Printing factory of the Health Sciences University of Mongolia

MOLECULAR DETECTION OF HBV AND HDV INFECTION AMONG HBsAg CARRIERS (MONGOLIA)

Azjargal B[1], Sarantuya G[2], Tsolmon S[1], Bira N[2], Batbaatar G[1]
[1]*School of Biomedicine, Health Sciences University of Mongolia*
[2] *School of Medicine, Health Sciences University of Mongolia*

ABSTRACT

Quantization of circulating hepatitis delta virus RNA is important for determining and monitoring the response to antiviral therapy and for understanding the complex dynamic interactions between hepatitis B virus and hepatitis D virus replication. There are scores of Polymerase Chain Reaction Assay studies on the quantitative molecular level of the hepatitis D Virus. The aim of this study was to evaluate via molecular detection the hepatitis D virus as a co-infection with hepatitis B virus in HBsAg carriers.

The study subjects consisted of 61 patients from the capital city of Mongolia who were infected with the hepatitis B virus. All of the 61 subjects were evaluated for the presence of HBsAg, anti-HBs, HBeAg, anti-HBe, anti-HBc, anti-HDV, anti-HCV, and the presence of HBV-DNA and HDV-RNA.

This study shows that 31.25% of HBsAg carriers had anti-HDV, and hepatitis B and D viruses with a viral load detected at a ratio of 2:4 in the study participants.

Key words: Hepatitis B virus, Hepatitis Delta Virus, Real Time Polymerase Chain Reaction

INTRODUCTION

Hepatitis Delta virus (HDV) infection is present globally and infects human beings already infected by Hepatitis B virus (HBV). It is estimated that 40% of the world's population has had contact with carriers of the hepatitis B virus. This corresponds to an estimated 350 million people who are HBV carriers/1/. It has been estimated that approximately 5% of HBV carriers are co-infected with HDV, leading to an estimated 15 million people infected with HDV worldwide /2/.

Hepatitis Delta is seen more frequently in Africa, South America, Romania, Russia, and the Mediterranean region including Southern Italy /1/. Around 15-20% of the population of Mongolia are carriers of HBV /3/. Among the HBsAg carriers, anti-HDV was detected in 92%, with genotype I predominant in Mongolia /3/. The dual infection of HBV and HDV occurs in the form of co-infection or as a super-infection. The super-infection of HDV with HBV causes a progressive, chronic liver disease in up to (80%) of those infected, which further exacerbates liver cirrhosis and hepatocellular carcinoma (HCC). Patients infected by both HBV and HDV viruses have an increased risk of a more severe, acute liver disease, and an increased risk for developing fulminate hepatitis when compared to patients infected with HBV only /4/. Nevertheless, information on quantitation of hepatitis Delta Virus RNA (HDV-RNA by RT-PCR) is scarce. The aim of this study was to evaluate via molecular detection the HDV as a co-infection with HBV in HBsAg carriers in Mongolia. We report qRT-PCR results of HDV-RNA among HBsAg carriers who are either negative or positive for anti-HDV in respect to their disease severity.

***Corresponding author:**
Azjargal Batjargal
Post graduate Institute
Chingeltei district, Juulchin street-38, Taiwan Culture center-208
Phone: 50119993, 99104441
Fax: 11-50119993
E-mail: azaa6539@yahoo.com

METHOD AND

Sample collection

This study was followed by principles outlined in the Helsinki Declaration, with an agreement for performing our research from the Ethical Committee of Bio Medicine. A total 61 subjects from the capitol city of Mongolia, who were previously checked for HBsAg by ELISA, were evaluated for the study done during 2009-2010 at the School of Health Technology. Forty seven of the subjects were enrolled in the study by the inclusion criteria because they were positive for HBsAg and negative for anti-HCV (Figure 1).

Evaluation of liver enzyme activity was to include the following:

Alanineaminotransferase(ALT),aspartateaminotransferase (AST), and gamma glutamyl transpeptidase (GGT) all evaluated by using standard methods of ELITech Inc (Germany).

Figure1. Disposition of subjects and main features of the study.

Cancer and viral markers by ELISA

Alpha fetoprotein (AFP) was evaluated by using the methodology described in the manufacturer's protocol of Eu Cardio Inc (USA).

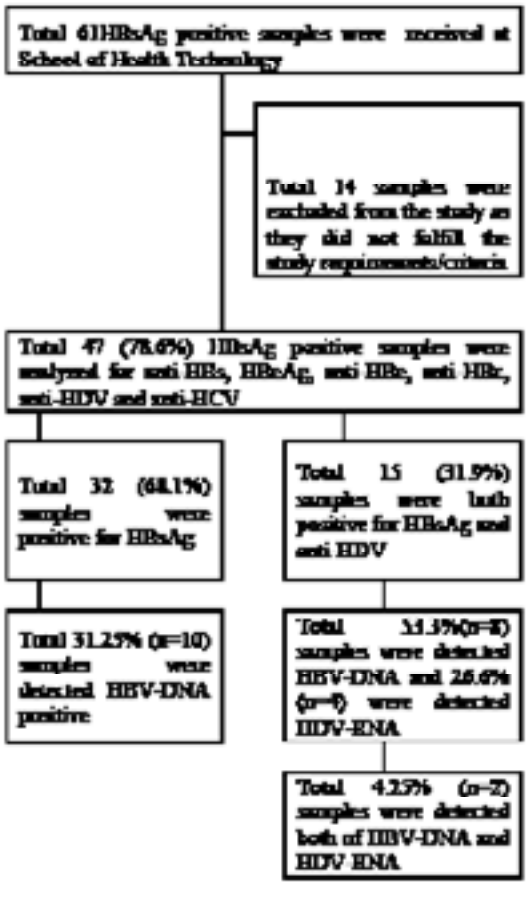
Initially all the serum was checked for HBsAg, anti-HBs, HBeAg, anti-HBe, anti-HBc, and anti-HCV index using DRG kits (Germany). Anti-HDV antibody was detected by using quantitative ELISA (RDG, China) kits using the methodology described in the manufacturer's protocol.

Quantitation of HBV-DNA and HDV-RNA by RT-PCR

HBV-DNA and HDV-RNA were extracted from 50 uL serum samples using Genesig (Primer Design, UK). DNA and RNA detection was done according to the manufacturer's protocol.

Quantitation of HBV-DNA and HDV-RNA was done by using Genesig kits (Primer Design, UK) and MX 3000 P (Applied by Stratagene Agilent Inc.,) and all the probes were thoroughly followed.

Figure1. Disposition of subjects and main features of the study



Statistical analysis

All of the data was analyzed by using SPSS 19.0 software and expressed as the mean ±SD. Statistical significant was assigned at the $p<0.05$ level. Independent T tests were used to compare differences of means between HBsAg positive groups with or without anti-HDV.

RESULT

A total of 22.9% (n=14) samples were excluded from the study since they fell within the exclusion criteria being negative for HBsAg or positive for anti-HCV. From those excluded samples, 9.83% (n=6) were positive for anti-HCV, 1.6% (n=1) was negative for any virus, and 1.6% (n=1) was negative for HBsAg, but positive for both of anti-HBc and anti-HDV. Out of the 47 enrolled patients, 53.19% (n=25) were females and 46.80% (n=22) were males. The mean age was 38 ± 12 years.

We divided the HBsAg positive patients into two groups based on the anti-HDV result. The HBsAg and anti-HDV positive subjects had higher levels of ALT and AST when compared with those who were negative for anti-HDV (Table 1).

Table1. Comparison of liver function test results and other characteristics between HBsAg positive subjects with or without hepatitis Delta virus (anti-HDV) infection

	Group 1 anti-HDV negative n=32	Group 2 anti-HDV positive n=15	T	p
ALT (IU/L)	48.59±29.35	71.27±43.54	-2.72	0.044*
AST(IU/L)	56.81±28.8	84.54±43.07	-2.57	0.01*
GGT(IU/L)	59.97±57.33	85.66±84.7	-1.2	0.23
AFP (ng/mL)	2.06±4.6	4.72±6.52	-1.13	0.264
PT &INR	1.12±0.38	0.96±0.41	1.36	0.18

Results are mean±StandardDevision

ALT- alanine aminotransferase; AST- aspartate aminotransferase; GGT- gamma glutamyltranspeptidase; AFP- alpha fetoperotein; PT&INR- Prothrombin Time and International Normalized Ratio; Upper limits range of ALT and AST is 45 international units per liter (IU/L) and 50 IU/L for GGT.

A total 31.25% (n=15) samples were positive for both anti-HDV and HBsAg, and 68.75% (n=32) samples were positive for HBsAg only. By the quantitative RT-PCR results, 31.25% (n=10) of the samples were positive for HBV-DNA in the first group; and 53.3% (n=8) of the samples were positive for HBV-DNA and 26.6% (n=4) of the samples were positive for HDV-RNA in the second group.

DISCUSSION

One of the interesting findings of the current study is that 31.25% (n=15) were seropositive for both HBsAg and anti-HDV, with molecular detection at a ratio of 2:4. There is a decreasing prevalence of both acute and chronic HDV infections in the Mediterranean area and in many other parts of the world, which has been attributed to a decline in the prevalence of chronic HBsAg carriers in the general population /5/. Although epidemiologic studies on HDV infection are scarce, the rate of people who were seropositive for anti-HDV and HDV found in this study was lower in comparison to an earlier study done in 1988 among the same population /6/. In addition, among the HBsAg carriers, anti-HDV was detected in 92%, and HDV-RNA was detected in 83.3%/4/. Our results maybe differ from other researchers results since we had a comparably fewer number of participants.

In our study there was one subject who was positive for both anti-HDV and anti-HBc, but negative for HBsAg. This subject was also negative for the HDV-RNA. It indicates a past infection with HBV and HDV. This result is similar to Davaalkham's study /7/.

In summary, 31.25% (n=15) of HBsAg carriers were seropositive for anti-HDV. HBV-DNA was detected in 38.2% (n=18) of the samples, and HDV-RNA was detected in 8.51% (n=4) of the samples. Viral load for HBV and HDV was detected at a 2:4 ratio. Given the high prevalence of HDV infection, and the high rates of chronic liver disease associated with viral hepatitis in our population, further studies are urgently needed to find ways to help prevent the spread of viral hepatitis in Mongolia.

ACKNOWLEDGEMENTS

We thank the study participants, field staffs, school teachers of the School of Health Technology and the School of Biomedicine of Health Sciences University of Mongolia, and Stand laboratory.

REFERENCES

1. World Health Organization Hepatitis Delta. [http://www.searo.who.int/EN/Section10/Section1027_9489.htm], [WHO/CDS/CSR/NCS/2001.1].
2. Farci P,Delta hepatitis: an update. J Hepatol2003, 39(Suppl 1), S212-S219.
3. Takahashi M, Nishizawa T, Gotanda Y, Tsuda F, Komatsu F, Kawabata T, Hasegawa K, Altankhuu M, Chimedren U, Narantuya L, Hoshino H, Hino K, Kagawa Y, Okamoto H, Highprevalence of antibodies to hepatitis A and E viruses and viremia of hepatitis B, C and D viruses among apparently healthy populations in Mongolia. 2004, *ClinDiagn Lab Immunol 11:392-398.*
4. Yamaguchi Y, Handa H: HIV and hepatitis delta virus:evolution takes different paths to relieve blocks in transcriptionalelongation. 2002, Microb Infect, 4:1169-1175.
5. Aragona M, Macagno S, Caredda F, et al. Serological response to thehepatitis delta virus in hepatitis D. Lancet. 1987, 1:478–82.
6. Nymdavaa P, Anan'ev VA, OyunbilegZh, ChernovetskiiMA.Thefreaquency of detecting antibodies to delta antigen in virtually healthy HBsAg and anti-HBs carriers in Ulaanbaator.1988, VoprVirusol 33: 246-247.
7. Davaalkham D, Ojima T, Watanabe M, Oki I, Nymadawa P, Takahashi M, Okamoto H, Nakamura Y. Hepatitis Delta Virus infection in Mongolia: Analyses of geographic distribution, risk factors, and disease severity. 2006,*Am J.Trop.Med.Hyg., 75 (2), 365-369.*

VITAMIN D STATUS AMONG IN MONGOLIAN ADULTS

Ch.Bayarjavkhlan[1,2], E.Bayarmaa[2], G.Naran[1]
[1]*Health Sciences University of Mongolia*
[2]*Gurvan Gal Teaching Hospital of HSUM*

ABSTRACT

Vitamin D deficiency or insufficiency is prevalent in practically every segment of the countries' population, including children and young adults. This worldwide problem remains generally unrecognized and untreated.

To our knowledge, no study on vitamin D deficiency was conducted in Mongolia in an occupational setting. Purpose of the study is the identification of the vitamin D status in Mongolia..

An analytical cross sectional study was conducted in Ulaanbaatar, Mongolia. We studied a total of 73 (20 male, 53 female) participants, apparently healthy adults (aged 21-96 years, mean age 58.5 years). Data were collected during an one year period from Jan 1, 2011-Jan 1, 2012 in the Gurvan gal teaching hospital of HSUM. All statistical analyses were performed using SPSS for Windows 17.0. Informed written consent was obtained from all participants.

We enrolled 73 participants in the study (mean age 58.5 years): 27.3% male (n=20, mean age 45 years), 72.7% female (n=53, mean age 58.5 years), and 69.8% were less than 50 years old. All participants were from Ulaanbaatar. No participants were taking calcium or vitamin D as a supplement. None had a parathyroid problem, chronic kidney disease, liver disease or other medical conditions, which might affect vitamin D metabolism. No significant differences between females and males were observed for 25-OH vitamin D3 values (20 [4-17.89] ng/ml versus 53 [4-20.06]ng/ml; *p=0.3*). The prevalence of severe vitamin D deficiency in all participants was 72.6%, vitamin D deficiency levels were found in in 26.0%, and insufficient vitamin D levels were identified for 1.36%, respectively.

As having a nomadic culture in Mongolia for many centuries, it is fact that there is an increasing migration of citizens from the countryside to the capital city UB in the last 10 years. This urbanization movement has changed the lifestyle of people. Finally, the sedentary (indoor) lifestyle and improper diet causes the vitamin D deficiency.

Key words: Vitamin D, 25(OH)D, vitamin D deficiency, lifestyle factors, calcium

INTRODUCTION

Vitamin D has been associated primarily with bone health, and it is well understood that vitamin D deficiency leads to rickets in children and osteomalacia and osteoporosis in adults [1]. However, it is now known that adequate vitamin D status is important for optimal function of many organs and tissues [2]. Directly or indirectly, 1,25(OH)2D regulates over 200 genes, including those involved in rennin production in the kidney, insulin production in the pancreas, release of cytokines from lymphocytes, production of cathelicidin in macrophages, and growth and proliferation of both vascular smooth muscle cells and cardiomyocytes [1]. Vitamin D deficiency or insufficiency is prevalent in practically every segment of the countries' population, including children and young adults. This worldwide pandemic remains generally unrecognized and untreated. Vitamin D deficiency seems to predispose to hypertension, diabetes and the metabolic syndrome, autoimmune diseases, left ventricular hypertrophy, congestive heart failure, and infectious diseases, chronic vascular inflammation. Although a consensus regarding the optimal level of serum 25(OH)D has not yet been established, most experts define vitamin D deficiency as a 25(OH)D level of 20 ng/ml and vitamin D insufficiency as 21 to 29 ng/ml in Table 1. For all studied end points to date, the optimal concentration of 25(OH)D is at least 30 ng/ml [3]. Vitamin D status is largely due to exposure to sunlight, which induces vitamin D production in the skin. Accordingly, vitamin D levels show clear seasonal variation: they are highest in late summer and lowest in late winter or early spring [4]. The identification of determinants of vitamin D levels is a prerequisite for an effective intervention.

***Corresponding author:**
Ch.Bayarjavkhlan
Health Sciences University of Mongolia
Sukhbaatar District, S.Zorig's Street-3, Ulaanbaatar-14210
Mongolia
Tel.: (+) 976-9907-8044
E-mail: javkhaac@yahoo.com

Studies have shown that vitamin D concentrations are lower in women than in men, decrease with aging, and high body mass index (BMI), and increase with physical activity, outdoor activity, and intake of vitamin D, vitamin D supplements, and fish. Sunscreen with a sun protection factor of 15 blocks approximately 99% of the cutaneous vitamin D production [5,6,7,8,9,10,11,12]. Additionally, obesity is associated with vitamin D deficiency, probably because of a decreased bioavailability of vitamin D that is sequestered in the fat of individuals with excess adipose tissue. After equivalent exposure to UVB radiation or a bolus dose of vitamin D2, obese individuals showed 50% lower blood levels of vitamins D3 and D2 compared with non-obese individuals, probably because of sequestering of 25(OH)D in adipose tissue. Older age also reduces the capacity for UVB-induced cutaneous synthesis of vitamin D. After equal doses of sunlight exposure, a 70-year-old person produces 75% less vitamin D3 than a 20-year-old person. Other risk factors for vitamin D deficiency are listed in Table 2. To our knowledge, so far no study on vitamin D deficiency was conducted in an occupational health setting in Mongolia.

Table 1. Vitamin D status

Serum 25-Hydroxyvitamin D (ng/ml)	Vitamin D Status
<10	*Severe deficiency*
10-20	*Deficiency*
21–29	*Insufficiency*
30	*Sufficiency*
150	Toxicity

Table 2. Risk factors for vitamin D deficiency

1. *Elderly*
2. *Darkly pigmented skin*
3. *Institutionalized or homebound*
4. *Increased distance from equator*
5. *Winter season*
6. *Cover-up clothing and/or sunscreen*
7. *Air pollution*
8. *Smoking*
9. *Obesity*
10. *Malabsorption*
11. *Renal disease*
12. *Liver disease*
13. *Medications: anticonvulsants, glucocorticoids, antirejection, and human immunodeficiency virus medications*

METHODS

We studied a total of 73 (20 male, 53 female) participants, apparently healthy adults (aged 21-96 years, mean age 58.5 years). Data was collected during an one year period from Jan 1, 2011-Jan 1, 2012 in Gurvan gal teaching hospital of HSUM. Ten ml of blood was collected from a peripheral vein, and it was centrifuged at 3000 rpm for 5 minutes. Vitamin D3 adequacy was evaluated by measuring serum 25-hydroxyvitamin D (25 (OH)D concentration, as this was the primary circulating form of vitamin D. Serum 25-OH vitamin D3 was measured by an ECLIA (**e**lectro**c**hemi**l**uminescence **i**mmuno**a**ssay) using COBAS e411 analyzer (Roche, Germany). Exclusion criteria consisted of a history of liver disease, renal failure, cancer, or calcium or vitamin D supplement use or the presence of parathyroid problem. This analytical cross sectional study was conducted in Ulaanbaatar, Mongolia. All statistical analyses were performed using SPSS for Windows 17.0. Informed written consent was obtained from all participants.

RESULTS

We enrolled 73 participants in the study (mean age 58.5 years): 27.3% male (n=20, mean age 45 yr), 72.7% female (n=53, mean age 58.5yr), and 69.8% were less than 50 years old. Of participants, 100% were from Ulaanbaatar. No participants were taking calcium or vitamin D as a supplement. None had a parathyroid problem, chronic kidney disease, liver disease or other medical conditions, which might affect vitamin D metabolism. No significant differences between females and males were observed for 25-OH vitamin D3 values (20 [4-17.89] ng/ml versus 53 [4-20.06] ng/ml; *p=0.3*). A nonsignificant variation of 25OH vitamin D3 values was also found by ANOVA analysis in three age-groups (22-40, 41-60, >60 yrs), in both genders. The prevalence of severe vitamin D deficiency in all participants was 72.6%, for vitamin D deficiency levels 26.0%, and insufficiency vitamin D levels for 1.36%, respectively. 25-OH vitamin D3 concentrations were found nonsignificant for men and women in four seasons ($p<0.001$) in Table 3.

DISCUSSION

This as the first of this kind found quite a high prevalence of severe vitamin D deficiency (72.6%), vitamin D deficiency (26.0%) and insufficiency (1.36%) (Table 3) in Ulaanbaatar, Mongolia. Literature research showed that other countries reported to have found vitamin D deficiency (as defined by a 25(OH)D level of less than <20 ng/mL) in 40-100% of those tested, with proportions varying according to indoor lifestyle. The Third National Health and Nutrition Examination Survey (NHANES III) reported the prevalence of vitamin D deficiency in the U.S.A. as between 25% and 57% of adults [14]. Within the Asian region, there are not many reports on vitamin D

Table 3.

Vitamin D status of Mongolian adults aged between 21 to 76 years, 2011-2012

Category	Definition (serum 25-OHD levels)	Prevalence (%)
• Severe deficiency	• Less than 10 ng/ml	• **72.7%**
• Vitamin D deficiency	• Equal to or greater than 10 and less than 20ng/ml	• **26.0%**
• Insufficiency	• Equal to or greater than 21 and less than 29 ng/ml	• **1.36%**
Recommended level	• Equal to or greater than 30 and less than 50ng/ ml	• #
• Equal to or above recommended level	• Equal to or greater than 51 ng/ml	• #
• Toxicity	• Equal to or greater than 75ng/ml	• #

status of the population except pockets of studies among children, pregnant women or post-menopausal women. Such as in India, generally low serum 25(OH) D concentrations have been reported; the mean serum 25(OH) D was 30 nmol/L in a survey among hospital staff, while the mean serum 25(OH)D was 35 nmol/L among pregnant women and 36 nmol/L in postmenopausal women. In Beijing, China, mean serum 25(OH)D in adolescent girls was 30-36 nmol/L [15] and in Japan, a low mean serum 25(OH) D of 34 nmol/L was observed in women younger than 30 years and 30 nmol/L in immobile older persons [16]. In the Korea National Health and Nutrition Examination Survey (KNHANES), vitamin D insufficiency was found in 47.3% males and 64.5% females [17]. As in other studies, vitamin D deficiency was more common in women than in men (78.7% vs. 66.4%) and mean 25 (OH) D levels in women were significantly lower than in men. Green et al. reported that over 60% of Malaysian women had vitamin D levels below 50 nmol/L compared to in this study found levels of approximately 87%. Similar results have been reported elsewhere. Male participants' vitamin D status was comparable with the Korean males (43% with Vitamin D insufficiency), poorer than the Vietnam males (20% with Vitamin D insufficiency) but much better than for males from Middle Eastern countries like Iran (69% with vitamin D deficiency). But in our study, no significant differences between females and males were observed for 25-OH vitamin D3 values (20 [4-17.89] ng/ml versus 53 [4-20.06] ng/ml). Existing evidence shows that elderly individuals are more likely to have low vitamin D levels. However, this study we found that there is no association between age and vitamin D status; the reason for this result remains unclear. To our knowledge, the present study is the first to examine the season-specific association between lifestyle factors and blood vitamin D levels in an occupational setting. Studies in Western countries have shown that blood vitamin D levels vary by season and that the prevalence of vitamin D deficiency was higher during winter [5,6]. Van der Wielen et al. [18] measured wintertime serum 25-hydroxyvitamin D concentrations in 824 elderly people from 11 European countries and found vitamin D levels lower than 20 ng/mL in 36% of men and 47% of women. Surprisingly, vitamin D deficiency was much more common in people living in sunny countries such as Italy, Spain and Greece than among those living in Scandinavian countries where sunlight exposure is less. The mean 25(OH)D level was low (4 ± 20.06ng/ mL) in our study population. In this study, the prevalence of vitamin D deficiency were 19.2 % in summer, 27.4% in autumn, and in 48% in winter, 5.4% in spring, respectively, which confirms seasonal variations in vitamin D status as well as vitamin D deficiency among the Ulaanbaatar working-age study group. Few Japanese studies have compared blood vitamin D levels in different seasons [13]. But in our study, there are no significant differences between Vitamin D deficiency and the four seasons. Our findings regarding smoking are similar to those of a study that analyzed data by season and showed that smokers had lower circulating vitamin D levels. Data suggesting that smoking lowers vitamin D concentrations have also been reported in studies that were adjusted for the seasons of blood collection and in those conducted in summer and winter [9, 10, 12]. The mechanism linking smoking to decreased vitamin D status is unclear, but Brot et al. [11] speculated that smoking alters hepatic metabolism of 25-hydroxyvitamin D due to its harmful compounds, which include tar, nicotine, and heavy metals. Interestingly, male alcohol drinkers tended to have higher mean vitamin D concentrations than nondrinkers in both seasons. A similar finding was reported in some, but not all, previous studies.

CONCLUSIONS

Our findings demonstrated that 72.6% of participants had severe deficiency of vitamin D level (< 10 ng/ml) and vitamin D deficiency levels were identified for 26.0%, and insufficiency vitamin D levels for 1.36%, respectively. In conclusion, we observed a high prevalence of vitamin D deficiency in a UB working population in four seasons. Lifestyle factors, including dietary vitamin D intake, smoking (men), and physical activity (men), indoor lifestyle,

were significant predictors of serum 25-hydroxyvitamin D concentration in four seasons. Vitamin D deficiency is being increasingly recognized worldwide. As having the Mongolian nomadic culture for many centuries, it is fact that during the last 10 years there has been an increased mobilization of citizens from the countryside to UB capital city. This urbanization movement has changed the lifestyle of people. Finally, the sedentary (indoor) lifestyle and improper diet causes the vitamin D deficiency.

REFERENCES

1. Holick MF. Vitamin D deficiency. N Engl J Med 2007;357:266–81.
2. Zittermann A. Vitamin D and disease prevention with special reference to cardiovascular disease. Prog Biophys Mol Biol 2006;92:39–48.
3. Bischoff-Ferrari HA, Giovannucci E, Willett WC, Dietrich T, Dawson-Hughes B. Estimation of optimal serum concentrations of 25-hydroxyvitamin D for multiple health outcomes. Am J Clin Nutr 2006;84:18 –28.
4. Holick MF. Photobiology of vitamin D. In: Feldman D, Pike JW, Glorieux FH, editors. Vitamin D second edition. London: Elsevier Academic Press; 2005. p. 37–45.
5. Hyppönen E, Power C. Hypovitaminosis D in British adults at age 45 y: nationwide cohort study of dietary and lifestyle predictors. Am J Clin Nutr. 2007;85:860–8.
6. Jacques PF, Felson DT, Tucker KL, Mahnken B, Rosenberg IH, et al. Plasma 25-hydroxyvitamin D and its determinants in an elderly population sample. Am J Clin Nutr.1997;66:929–36.
7. Scragg R, Camargo CA Jr. Frequency of leisure-time physical activity and serum 25-hydroxyvitamin D levels in the US population: results from the Third National Health and Nutrition Examination Survey. Am J Epidemiol. 2008;168:577–86;discussion 587–91.
8. van Dam RM, Snijder MB, Dekker JM, Stehouwer CD, Bouter LM, Heine RJ, et al. Potentially modifiable determinants of vitamin D status in an older population in the Netherlands: the Hoorn Study. Am J Clin Nutr. 2007;85:755–61.
9. Benjamin A, Moriakova A, Akhter N, Rao D, Xie H, Kukreja S, et al. Determinants of 25-hydroxyvitamin D levels in African- American and Caucasian male veterans. Osteoporos Int. 2009;20:1795–803.
10. Brock K, Huang WY, Fraser DR, Ke L, Tseng M, Stolzenberg-Solomon R, et al. Low vitamin D status is associated with physical inactivity, obesity and low vitamin D intake in a large US sample of healthy middle-aged men and women. J Steroid Biochem Mol Biol. 2010;121:462–6.
11. Brot C, Jorgensen NR, Sorensen OH. The influence of smoking on vitamin D status and calcium metabolism. Eur J Clin Nutr.1999;53:920–6.
12. Pasco JA, Henry MJ, Nicholson GC, Brennan SL, Kotowicz MA. Behavioural and physical characteristics associated with vitamin D status in women. Bone 2009;44:1085–91.
13. Nanri A, Foo LH, Nakamura K, Hori A, et al., Serum 25-hydroxyvitamin d concentrations and season-specific correlates in Japanese adults. J Epidemiol. 2011 Sep 5;21(5):346-53.
14. Looker AC, Dawson-Hughes B, et al., Serum 25-hydroxyvitamin D status of adolescents and adults in two seasonal subpopulations from NHANES III. Bone 2002, 30:771-777.
15. Foo LH, Zhang Q, Zhu K, Ma G, Trube A, Greenfield H, Fraser DR:Relationship between vitamin D status, body composition and physical exercise of adolescent girls in Beijing. Osteoporos Int 2009, 20:417-425.
16. K, Nashimoto M, Matsuyama S, Yamamoto M: Low serum concentrations of 25-hydroxyvitamin D in young adult Japanese women: a cross sectional study. Nutrition 2001, 17:921-925.
17. Choi HS, Oh HJ, Choi H, Choi WH, Kim JG, Kim KM, Kim KJ, Rhee Y, Lim SK: Vitamin D Insufficiency in Korea–A Greater Threat to Younger Generation: The Korea National Health and Nutrition Examination Survey (KNHANES) 2008. J Clin Endocrinol Metab 2010.
18. Van der Wielen RP, Löwik MR, van den Berg H, de Groot LC, Haller J, Moreiras O, van Staveren WA: Serum vitamin D concentrations among elderly people in Europe. Lancet 1995, 346:207-2l0.

VITAMIN D STATUS AMONG IN MONGOLIAN ADULTS

Ch.Bayarjavkhlan[1,2], E.Bayarmaa[2], G.Naran[1]
[1]*Health Sciences University of Mongolia*
[2]*Gurvan Gal Teaching Hospital of HSUM*

ABSTRACT

Vitamin D deficiency or insufficiency is prevalent in practically every segment of the countries' population, including children and young adults. This worldwide problem remains generally unrecognized and untreated.

To our knowledge, no study on vitamin D deficiency was conducted in Mongolia in an occupational setting. Purpose of the study is the identification of the vitamin D status in Mongolia..

An analytical cross sectional study was conducted in Ulaanbaatar, Mongolia. We studied a total of 73 (20 male, 53 female) participants, apparently healthy adults (aged 21-96 years, mean age 58.5 years). Data were collected during an one year period from Jan 1, 2011-Jan 1, 2012 in the Gurvan gal teaching hospital of HSUM. All statistical analyses were performed using SPSS for Windows 17.0. Informed written consent was obtained from all participants.

We enrolled 73 participants in the study (mean age 58.5 years): 27.3% male (n=20, mean age 45 years), 72.7% female (n=53, mean age 58.5 years), and 69.8% were less than 50 years old. All participants were from Ulaanbaatar. No participants were taking calcium or vitamin D as a supplement. None had a parathyroid problem, chronic kidney disease, liver disease or other medical conditions, which might affect vitamin D metabolism. No significant differences between females and males were observed for 25-OH vitamin D3 values (20 [4-17.89] ng/ml versus 53 [4-20.06]ng/ml; *p=0.3*). The prevalence of severe vitamin D deficiency in all participants was 72.6%, vitamin D deficiency levels were found in in 26.0%, and insufficient vitamin D levels were identified for 1.36%, respectively.

As having a nomadic culture in Mongolia for many centuries, it is fact that there is an increasing migration of citizens from the countryside to the capital city UB in the last 10 years. This urbanization movement has changed the lifestyle of people. Finally, the sedentary (indoor) lifestyle and improper diet causes the vitamin D deficiency.

Key words: Vitamin D, 25(OH)D, vitamin D deficiency, lifestyle factors, calcium

INTRODUCTION

Vitamin D has been associated primarily with bone health, and it is well understood that vitamin D deficiency leads to rickets in children and osteomalacia and osteoporosis in adults [1]. However, it is now known that adequate vitamin D status is important for optimal function of many organs and tissues [2]. Directly or indirectly, 1,25(OH)2D regulates over 200 genes, including those involved in rennin production in the kidney, insulin production in the pancreas, release of cytokines from lymphocytes, production of cathelicidin in macrophages, and growth and proliferation of both vascular smooth muscle cells and cardiomyocytes [1]. Vitamin D deficiency or insufficiency is prevalent in practically every segment of the countries' population, including children and young adults. This worldwide pandemic remains generally unrecognized and untreated. Vitamin D deficiency seems to predispose to hypertension, diabetes and the metabolic syndrome, autoimmune diseases, left ventricular hypertrophy, congestive heart failure, and infectious diseases, chronic vascular inflammation. Although a consensus regarding the optimal level of serum 25(OH)D has not yet been established, most experts define vitamin D deficiency as a 25(OH)D level of 20 ng/ml and vitamin D insufficiency as 21 to 29 ng/ml in Table 1. For all studied end points to date, the optimal concentration of 25(OH)D is at least 30 ng/ml [3]. Vitamin D status is largely due to exposure to sunlight, which induces vitamin D production in the skin. Accordingly, vitamin D levels show clear seasonal variation: they are highest in late summer and lowest in late winter or early spring [4]. The identification of determinants of vitamin D levels is a prerequisite for an effective intervention.

***Corresponding author:**
Ch.Bayarjavkhlan
Health Sciences University of Mongolia
Sukhbaatar District, S.Zorig's Street-3, Ulaanbaatar-14210
Mongolia
Tel.: (+) 976-9907-8044
E-mail: javkhaac@yahoo.com

Studies have shown that vitamin D concentrations are lower in women than in men, decrease with aging, and high body mass index (BMI), and increase with physical activity, outdoor activity, and intake of vitamin D, vitamin D supplements, and fish. Sunscreen with a sun protection factor of 15 blocks approximately 99% of the cutaneous vitamin D production [5,6,7,8,9,10,11,12]. Additionally, obesity is associated with vitamin D deficiency, probably because of a decreased bioavailability of vitamin D that is sequestered in the fat of individuals with excess adipose tissue. After equivalent exposure to UVB radiation or a bolus dose of vitamin D2, obese individuals showed 50% lower blood levels of vitamins D3 and D2 compared with non-obese individuals, probably because of sequestering of 25(OH)D in adipose tissue. Older age also reduces the capacity for UVB-induced cutaneous synthesis of vitamin D. After equal doses of sunlight exposure, a 70-year-old person produces 75% less vitamin D3 than a 20-year-old person. Other risk factors for vitamin D deficiency are listed in Table 2. To our knowledge, so far no study on vitamin D deficiency was conducted in an occupational health setting in Mongolia.

Table 1. Vitamin D status

Serum 25-Hydroxyvitamin D (ng/ml)	Vitamin D Status
<10	*Severe deficiency*
10-20	*Deficiency*
21–29	*Insufficiency*
30	*Sufficiency*
150	Toxicity

Table 2. Risk factors for vitamin D deficiency

1. *Elderly*
2. *Darkly pigmented skin*
3. *Institutionalized or homebound*
4. *Increased distance from equator*
5. *Winter season*
6. *Cover-up clothing and/or sunscreen*
7. *Air pollution*
8. *Smoking*
9. *Obesity*
10. *Malabsorption*
11. *Renal disease*
12. *Liver disease*
13. *Medications: anticonvulsants, glucocorticoids, antirejection, and human immunodeficiency virus medications*

METHODS

We studied a total of 73 (20 male, 53 female) participants, apparently healthy adults (aged 21-96 years, mean age 58.5 years). Data was collected during an one year period from Jan 1, 2011-Jan 1, 2012 in Gurvan gal teaching hospital of HSUM. Ten ml of blood was collected from a peripheral vein, and it was centrifuged at 3000 rpm for 5 minutes. Vitamin D3 adequacy was evaluated by measuring serum 25-hydroxyvitamin D (25 (OH)D concentration, as this was the primary circulating form of vitamin D. Serum 25-OH vitamin D3 was measured by an ECLIA (**e**lectro**c**hemi**l**uminescence **i**mmuno**a**ssay) using COBAS e411 analyzer (Roche, Germany). Exclusion criteria consisted of a history of liver disease, renal failure, cancer, or calcium or vitamin D supplement use or the presence of parathyroid problem. This analytical cross sectional study was conducted in Ulaanbaatar, Mongolia. All statistical analyses were performed using SPSS for Windows 17.0. Informed written consent was obtained from all participants.

RESULTS

We enrolled 73 participants in the study (mean age 58.5 years): 27.3% male (n=20, mean age 45 yr), 72.7% female (n=53, mean age 58.5yr), and 69.8% were less than 50 years old. Of participants, 100% were from Ulaanbaatar. No participants were taking calcium or vitamin D as a supplement. None had a parathyroid problem, chronic kidney disease, liver disease or other medical conditions, which might affect vitamin D metabolism. No significant differences between females and males were observed for 25-OH vitamin D3 values (20 [4-17.89] ng/ml versus 53 [4-20.06] ng/ml; *p=0.3*). A nonsignificant variation of 25OH vitamin D3 values was also found by ANOVA analysis in three age-groups (22-40, 41-60, >60 yrs), in both genders. The prevalence of severe vitamin D deficiency in all participants was 72.6%, for vitamin D deficiency levels 26.0%, and insufficiency vitamin D levels for 1.36%, respectively. 25-OH vitamin D3 concentrations were found nonsignificant for men and women in four seasons ($p<0.001$) in Table 3.

DISCUSSION

This as the first of this kind found quite a high prevalence of severe vitamin D deficiency (72.6%), vitamin D deficiency (26.0%) and insufficiency (1.36%) (Table 3) in Ulaanbaatar, Mongolia. Literature research showed that other countries reported to have found vitamin D deficiency (as defined by a 25(OH)D level of less than <20 ng/mL) in 40-100% of those tested, with proportions varying according to indoor lifestyle. The Third National Health and Nutrition Examination Survey (NHANES III) reported the prevalence of vitamin D deficiency in the U.S.A. as between 25% and 57% of adults [14]. Within the Asian region, there are not many reports on vitamin D

Table 3.

Vitamin D status of Mongolian adults aged between 21 to 76 years, 2011-2012

Category	Definition (serum 25-OHD levels)	Prevalence (%)
• Severe deficiency	• Less than 10 ng/ml	• **72.7%**
• Vitamin D deficiency	• Equal to or greater than 10 and less than 20ng/ml	• **26.0%**
• Insufficiency	• Equal to or greater than 21 and less than 29 ng/ml	• **1.36%**
Recommended level	• Equal to or greater than 30 and less than 50ng/ ml	• #
• Equal to or above recommended level	• Equal to or greater than 51 ng/ml	• #
• Toxicity	• Equal to or greater than 75ng/ml	• #

status of the population except pockets of studies among children, pregnant women or post-menopausal women. Such as in India, generally low serum 25(OH) D concentrations have been reported; the mean serum 25(OH) D was 30 nmol/L in a survey among hospital staff, while the mean serum 25(OH)D was 35 nmol/L among pregnant women and 36 nmol/L in postmenopausal women. In Beijing, China, mean serum 25(OH)D in adolescent girls was 30-36 nmol/L [15] and in Japan, a low mean serum 25(OH) D of 34 nmol/L was observed in women younger than 30 years and 30 nmol/L in immobile older persons [16]. In the Korea National Health and Nutrition Examination Survey (KNHANES), vitamin D insufficiency was found in 47.3% males and 64.5% females [17]. As in other studies, vitamin D deficiency was more common in women than in men (78.7% vs. 66.4%) and mean 25 (OH) D levels in women were significantly lower than in men. Green et al. reported that over 60% of Malaysian women had vitamin D levels below 50 nmol/L compared to in this study found levels of approximately 87%. Similar results have been reported elsewhere. Male participants' vitamin D status was comparable with the Korean males (43% with Vitamin D insufficiency), poorer than the Vietnam males (20% with Vitamin D insufficiency) but much better than for males from Middle Eastern countries like Iran (69% with vitamin D deficiency). But in our study, no significant differences between females and males were observed for 25-OH vitamin D3 values (20 [4-17.89] ng/ml versus 53 [4-20.06] ng/ml). Existing evidence shows that elderly individuals are more likely to have low vitamin D levels. However, this study we found that there is no association between age and vitamin D status; the reason for this result remains unclear. To our knowledge, the present study is the first to examine the season-specific association between lifestyle factors and blood vitamin D levels in an occupational setting. Studies in Western countries have shown that blood vitamin D levels vary by season and that the prevalence of vitamin D deficiency was higher during winter [5,6]. Van der Wielen et al. [18] measured wintertime serum 25-hydroxyvitamin D concentrations in 824 elderly people from 11 European countries and found vitamin D levels lower than 20 ng/mL in 36% of men and 47% of women. Surprisingly, vitamin D deficiency was much more common in people living in sunny countries such as Italy, Spain and Greece than among those living in Scandinavian countries where sunlight exposure is less. The mean 25(OH)D level was low (4 ± 20.06ng/ mL) in our study population. In this study, the prevalence of vitamin D deficiency were 19.2 % in summer, 27.4% in autumn, and in 48% in winter, 5.4% in spring, respectively, which confirms seasonal variations in vitamin D status as well as vitamin D deficiency among the Ulaanbaatar working-age study group. Few Japanese studies have compared blood vitamin D levels in different seasons [13]. But in our study, there are no significant differences between Vitamin D deficiency and the four seasons. Our findings regarding smoking are similar to those of a study that analyzed data by season and showed that smokers had lower circulating vitamin D levels. Data suggesting that smoking lowers vitamin D concentrations have also been reported in studies that were adjusted for the seasons of blood collection and in those conducted in summer and winter [9, 10, 12]. The mechanism linking smoking to decreased vitamin D status is unclear, but Brot et al. [11] speculated that smoking alters hepatic metabolism of 25-hydroxyvitamin D due to its harmful compounds, which include tar, nicotine, and heavy metals. Interestingly, male alcohol drinkers tended to have higher mean vitamin D concentrations than nondrinkers in both seasons. A similar finding was reported in some, but not all, previous studies.

CONCLUSIONS

Our findings demonstrated that 72.6% of participants had severe deficiency of vitamin D level (< 10 ng/ml) and vitamin D deficiency levels were identified for 26.0%, and insufficiency vitamin D levels for 1.36%, respectively. In conclusion, we observed a high prevalence of vitamin D deficiency in a UB working population in four seasons. Lifestyle factors, including dietary vitamin D intake, smoking (men), and physical activity (men), indoor lifestyle,

were significant predictors of serum 25-hydroxyvitamin D concentration in four seasons. Vitamin D deficiency is being increasingly recognized worldwide. As having the Mongolian nomadic culture for many centuries, it is fact that during the last 10 years there has been an increased mobilization of citizens from the countryside to UB capital city. This urbanization movement has changed the lifestyle of people. Finally, the sedentary (indoor) lifestyle and improper diet causes the vitamin D deficiency.

REFERENCES

1. Holick MF. Vitamin D deficiency. N Engl J Med 2007;357:266–81.
2. Zittermann A. Vitamin D and disease prevention with special reference to cardiovascular disease. Prog Biophys Mol Biol 2006;92:39–48.
3. Bischoff-Ferrari HA, Giovannucci E, Willett WC, Dietrich T, Dawson-Hughes B. Estimation of optimal serum concentrations of 25-hydroxyvitamin D for multiple health outcomes. Am J Clin Nutr 2006;84:18 –28.
4. Holick MF. Photobiology of vitamin D. In: Feldman D, Pike JW, Glorieux FH, editors. Vitamin D second edition. London: Elsevier Academic Press; 2005. p. 37–45.
5. Hyppönen E, Power C. Hypovitaminosis D in British adults at age 45 y: nationwide cohort study of dietary and lifestyle predictors. Am J Clin Nutr. 2007;85:860–8.
6. Jacques PF, Felson DT, Tucker KL, Mahnken B, Rosenberg IH, et al. Plasma 25-hydroxyvitamin D and its determinants in an elderly population sample. Am J Clin Nutr.1997;66:929–36.
7. Scragg R, Camargo CA Jr. Frequency of leisure-time physical activity and serum 25-hydroxyvitamin D levels in the US population: results from the Third National Health and Nutrition Examination Survey. Am J Epidemiol. 2008;168:577–86;discussion 587–91.
8. van Dam RM, Snijder MB, Dekker JM, Stehouwer CD, Bouter LM, Heine RJ, et al. Potentially modifiable determinants of vitamin D status in an older population in the Netherlands: the Hoorn Study. Am J Clin Nutr. 2007;85:755–61.
9. Benjamin A, Moriakova A, Akhter N, Rao D, Xie H, Kukreja S, et al. Determinants of 25-hydroxyvitamin D levels in African- American and Caucasian male veterans. Osteoporos Int. 2009;20:1795–803.
10. Brock K, Huang WY, Fraser DR, Ke L, Tseng M, Stolzenberg-Solomon R, et al. Low vitamin D status is associated with physical inactivity, obesity and low vitamin D intake in a large US sample of healthy middle-aged men and women. J Steroid Biochem Mol Biol. 2010;121:462–6.
11. Brot C, Jorgensen NR, Sorensen OH. The influence of smoking on vitamin D status and calcium metabolism. Eur J Clin Nutr.1999;53:920–6.
12. Pasco JA, Henry MJ, Nicholson GC, Brennan SL, Kotowicz MA. Behavioural and physical characteristics associated with vitamin D status in women. Bone 2009;44:1085–91.
13. Nanri A, Foo LH, Nakamura K, Hori A, et al., Serum 25-hydroxyvitamin d concentrations and season-specific correlates in Japanese adults. J Epidemiol. 2011 Sep 5;21(5):346-53.
14. Looker AC, Dawson-Hughes B, et al., Serum 25-hydroxyvitamin D status of adolescents and adults in two seasonal subpopulations from NHANES III. Bone 2002, 30:771-777.
15. Foo LH, Zhang Q, Zhu K, Ma G, Trube A, Greenfield H, Fraser DR:Relationship between vitamin D status, body composition and physical exercise of adolescent girls in Beijing. Osteoporos Int 2009, 20:417-425.
16. K, Nashimoto M, Matsuyama S, Yamamoto M: Low serum concentrations of 25-hydroxyvitamin D in young adult Japanese women: a cross sectional study. Nutrition 2001, 17:921-925.
17. Choi HS, Oh HJ, Choi H, Choi WH, Kim JG, Kim KM, Kim KJ, Rhee Y, Lim SK: Vitamin D Insufficiency in Korea–A Greater Threat to Younger Generation: The Korea National Health and Nutrition Examination Survey (KNHANES) 2008. J Clin Endocrinol Metab 2010.
18. Van der Wielen RP, Löwik MR, van den Berg H, de Groot LC, Haller J, Moreiras O, van Staveren WA: Serum vitamin D concentrations among elderly people in Europe. Lancet 1995, 346:207-2l0.

STUDY ON THE REALITY OF FIRST AID DURING ROAD TRAFFIC ACCIDENTS AND INJURIES

Boldmaa.G[1], Chimedsuren.O[1], Oyunbileg.N[2]
[1]Public Health School of the Health Sciences University Mongolia, [2]MCA-Mongolia

ABSTRACT

The purpose of the study is the assessment of the reality of first aid during road accidentsin urban and rural areas, assessment of knowledge, practice and the trend of population among riskful group andthe readiness of first aid facilities.

30 cases of traffic road accidentswere studied with an epidemiologicapproach; 64 drugstores and shops in urban and rural areaswere observedand in total 1068 rural and urban people were involvedin the study through action methods .

The percent of injured pedestrians was66.7%in the 30 cases and 23.3% of them could have been involved in first aid. Although first aid was conductedfor 40% of accident victims by accompanying people, drivers and other people, 66.7% of this first aid services were wrongly conducted, and there was no first aid service at all provided for 60% of the victims. There was no first aid material available in all of these cases. 50.7% of 1068 total participants who participated inthe assessment of knowledge, practice and trend of participants had no knowledge at all about first aid, although a quarter of the studied personshad attended training, 69.9% of them have never performed first aid before, one of every two participants of the study had no material for emergencies or faced problems as lacking knowledge and experiencesin first aid.There was afirst aid corner in 58.3 % of the observed drugstores and shops in Ulaanbaatar city and in 30.3 %in the rural places.

The results of this study demonstrate that the citizens have not enough knowledge, practice and trends to provide first aid during accidents and injuries and no materials for first aid were available. Training in first aid is requiredfor the citizens, a complex of first aid materials should be available in all drugstores and shops and its usage commonly improved.

Key words: Trauma and injures, first aid policy, first aid training

INTRODUCTION

Road traffic accidentsare one of the urgent social health issues faced in Mongolia. Worldwidefive million people annually die due to road traffic accidents, illustrating thehigh importance of pre-medical aid especially in poor and developing countries. In Mongolia, deaths from external effects takes the 3rd place (15.2[1] per 10,000 people) within total deaths and 427 peoplewho died due to road traffic accidents. 46.7% of the studied population who could have received the service of first medical aid were injured with brain damages, 23.8%withlower organ damages,13.5%with body damages,12%with higher organ damages, and 4% with mixed damages.. 42.5% of the citizens who became patients in hospitalscould have received a service of first medical aid were injured with brain damages, 23.7%, with lower organ damages,16.9%with body damages,12%with higher organ damages, and 4,8% with mixed damages.

***Corresponding author:**
BoldmaaGanbold
Public Health School of the Health Sciences University Mongolia
Sukhbaatar district, Choidog street-5, 1stkhoroo
Phone: 70111163 /726/ 99955838
Fax: 70111164
E-mail: g.boldmaa@yahoo.com

Although the traffic police arrives in the case of road traffic accidents first of all, the service to victims starts with an examination and inspection of the vehicles and the road situationbefore any first aid in general is provided, which often goes along with a time-loss and wrongly provided services due to the shortage of first aid relatedknowledge, abilities and trend. Although there are some studies about the reasons and types of road traffic accidents and whether victims receive first medical aid or not, there had never any study been conducted with and about people at the exact places of the accidents renderingfirst aid to themselves and friends, which provides the background of the present study.

There was 15 cases of road traffic accidents registered in September and for this time period, 18 cases (60%) of road traffic accidents were registered between 21.00 and 23.00 o'clock. Of the people injured 26.7%lived in the suburb of the Bayangol districtand23.3%in Bayanzurkh district. Most of the pedestrians (66.7%) were injured when they crossed the road. 10% of victims suffered frombone fractures, 30% from openwounds, and 43.3% from other injuries that occurred in the accident. During the accident, the calls

to the emergency center were done within an average of 6.1 minutes after the accident; the emergencies arrived in average within 28.6 minutes at the location of the accident after the emergency call. But 23.3% of all the cases taken the call came first aid service. First aid was provided by accompanying people, drivers and other people to 40% of all the accident victims. From this, 33.3%of first aid was correctly conducted and 66.7% was conducted incorrectly. In accident situations, there was no first aid material available and 60% of the accident victims were not at all provided with any first aid service.

Table 1

Age and sex of victims in road traffic accidents

		Male			Female			P-value
	Indications	**n**	**%**	**Std. deviation**	**n**	**%**	**Std. deviation**	
1	First injured age	69	22.39	10.80	57	24.44	12.14	0.32
2	Second injured age	11	31.00	11.88	11	32.64	8.79	0.718

94people (8.8%) of 1068 total participantsin the study were victims of road traffic accidents. 32 participants (3%) were injured twice or more than twice.For comparing (55.3 %) of men to (44.7 %) of women, the accident spread is relatively highly –graded with statistically expected. 50.7% of total participants in the study answered wrongly to 15 questions assessing the knowledge and49.3% of them answered correctly.The incorrectly answeredquestions included 74.3% of incorrect answers related to first medical aid to injured persons, 50.8% were incorrect answers related to self-protection, 85.6%of incorrect answerswere given to questions about whether artificial breath is successful or not,79.4% of incorrectly answered questions were related to first medical aid for personswho loses his/her consciousness or artificial breath for persons who can't breath. 54.9% of participants answered wrongly to the question of first aid in the case of blood loss, and 79% of them answered wrongly about shock symptoms respectively. The following problems became visible in the study: for example, although a quarter of persons attended training 69.9% of them have never rendered first aid to others and one per two persons have no material for first aid availableand had not enough knowledge and experience in it. Although 75.5% of people, who had never attended training, found out information about first aid from the mass media41.9% of them could not afford the required materials for first aid constantly. 87.8% of participants in the study consideredfirst aid training as the most importantand 53.7% thought that that every citizen (61.9%) needs training with definite payment .

DISCUSSION

Results of a study on traffic road accidents including the knowledge assessmentof first aid rendered by doctors during accidents showed that the level of knowledge about first aid was 29.4%, and stated that the knowledge is unsatisfying.[2]In an Australian study about first aid usagewith South Australian scholars,aged 13-20 years old, 96.7% hada basic level of knowledge and ability to render first aid.[3]This result illustrates that it would be useful to start with first aid training already in school-age.Even though a required complex of first aid facilities is on the way and has been approved by the Resolution no 74 by the Government of Mongolia in April 2005and is mentioned on the 'Traffic law of Mongolia', it is not yet implemented. sorry, this is not understandable[4]required medicines and materials in medicine box in a vehicle in Federation of Russia was approved order by minister of Health and medicine industry Ministry of Federation of Russia .[5]

There are 'first aid corners' in 100% of medicine and hospital equipment supply organizations in Ulaanbaatar city andin 60% of organizations in the rural areas. There were'first aid corners' in 16.7% of city supermarkets and shops, andin 5% of rural places. In these places 41.5%had dressing material available, 13.3%wrapping types, 45.5% wound plasters and scale of20.2 %plasters, 24.3% trauma joint material, 6.1%splints, and 30.4% sterilizing material for openwounds.

CONCLUSIONS

1. During road traffic accidents four of every ten injured people could have received first aid and three of them received it but wasconductedwrongly; in terms of equipment ,there is no material available for rendering first aid and six of every ten accident victims didn't receive first aid.
2. One of every two people has no knowledge to conduct first aid. Three of every four people have never participated in any first aid training; people who participated in first aid training had no practicein rendering first aid. Some people considered that only doctors or medical staffshould render first aid during road traffic accidents. 88% of all participants of

training courses consideredfirst aid training as most important. The results of the study indicate that there is a need for the provision of a step-by-step training curriculumand training on first aid for Mongolian citizens.

3. The study results indicate that there are not enough first aid facilities, medical facilities and first aid equipment medical equipment supply organizations, drugstores, trade and service shops, supermarkets and retail places in the capital city, the provinces and the districts.

REFERENCES

1. Government of Mongolia- HealthDepartment.Health indications. 2010.
2. Oyunbileg.N, Budjav.L, Gankhuu.Ts. Study on knowledge and trend of first aid provided by doctors during Road traffic accidents.2004.
3. Flabouris A, Bridgewater F. An analysis of demand for first-aid care at a major public event. 1996. http// www.pubmed.gov/prehospitaldisastermed/1996Jan-Mar;11(1);48-54.
4. Government of Mongolia. Traffic Law of Mongolia. 1996.
5. http// www.treehouse.ru/medicine/drugs/first/auto.shtml Accessed 02/03/20035

CORPORATE SOCIAL RESPONSIBILITY: THE CASE OF WORK-SITE HEALTH PROMOTION

Dandar. S[1], Munkh-Erdene .L[2,3], Tseden .P[2], Lkhagvasuren[2] .Ts
[1]Erdenet Mining Corporation LLC, Erdenet Preventive Clinic
[2]Health Science University of Mongolia
[3]National Taiwan University

ABSTRACT

In the past decades work-site health promotion has become an increasingly popular strategy through which corporations and other employers are said to exercise social responsibility. Any activity of corporate social responsibility (CSR) can potentially be seen as an expression of organizational control through which all the more aspects of an organization environment come to be enacted by the organization in a way favorable to the organization aims and perspectives. Health is an important variant of organizational norm that requires a certain kind of behavior among employees and other actors in the organization's environment. In this way, health promotion can be regarded as a sublime and particularly effective means of social control that operate both intrapsychically and in terms of cultural values and norms. This anticipated consequence of health promotion deserves attention in order to better understand the potentials and pitfalls of modern CSR.

Key words: Corporate social responsibility; Corporate social control; Work-site health promotion

INTRODUCTION

While corporate social responsibility (CSR) was widely discussed in the last forty years of twentieth century, the idea that business has societal obligations was evident at least as early as the nineteenth century. In recent years the global mining industry has taken up the mantle of corporate social and environmental responsibility; numerous factors have contributed to this, and the extractive industry is the key in debates about social and environmental sustainability[1-4]. First, they aim to respond to the demands by all interest groups, such as employees, suppliers, dealers, local communities, and even nations. Second, the content of CSR has expanded, from relatively narrow concerns of obvious importance to the corporation, to such broad and complex issues as unemployment, racial discrimination, pollution, urban decay, poverty, and community welfare[4]. CSR is today a concept that captures the attention by corporations to a broad range of experienced problems in their environments. In some literatures two principal gains including a positive correlation between CSR and performance and even work health[5, 6]. The vast majority of today's publications on CSR do not seriously examine CSR as a desirable organizational and managerial practice. Largely, CSR is a taken for granted activity among today's corporations. It has captured the imagination of many managers and policy makers [4, 7]. Based on some literature we would suggest that should empirically explore the increasingly popular CSR of health promotion on work place. CSR in health is not just an issue for large, multinational companies and also looking at how health issues affect worker performance, recruitment, longevity, and workplace morale. These concerns are an important part of the motivation behind employers' efforts to implement health promotion activities in the workplace. Basically, health promotion consists of techniques of gathering information about employee behavior as well as programs for changing behavior according to certain norms and ideas as held by the corporation. They consist of various programs including health promotion, health management, disease management and multiple components that are designed to change employees' behavior in order to achieve better health and reduce the associated health risks. Compared to traditional medical health programs of prevention of sickness and disease, and rehabilitation of disorders caused by injuries at work, health promotion programs focus not only on employees' physical and mental bio-medical conditions relevant to their professional role; but also on their total life situation including family, and sexual relations, fitness, eating, drinking, smoking, sleeping habits, worker's morale and so on. Well-known work-site health promotion programs stress a holistic approach to individuals' attitudes and behaviors, thus overcoming the limits of traditional

***Corresponding author:**
Sukhbaatar Dandar Erdenet Preventive Clinic,
Erdenet Mining Corporation LLC Amar Square 1,
Bayan-Undur soum (Erdenet city), Orkhon province, Mongolia
Phone: 976-99351432
Fax: 976-11-321249
E-mail: s_dandar@yahoo.com,

medical services as offered by employers. Typically work-site health promotion not only includes an employee's bio-medical disorders such as physical and mental problems that can be diagnosed and treated through regular medical examinations and interventions; it also concerns alleged problems and risks in the employee's social life enacted both inside and outside the work site that may constitute important sources of uncertainty for the corporation [4, 6, 8].
A common idea in the literature that work-site health promotion aim to contribute both to corporations' financial performance through increased employees productivity and to corporations' social legitimacy [9]. In the sociological discourse on medicine, health is not only defined as "feeling well", it is also understood as "behaving well" according to certain norms and interests [10]. On the other hand promoting health can be seen as a socially responsible activity in the sense of supporting employees to improve their medical condition and wellbeing, thus fulfilling and ambition of social improvement. Then such activities may be a mechanism of corporate control through which organizations try to create better behavior among employees and other actors in their environments, i.e., behavior that is more aligned to company norms and routines.

CSR AND WORK-SITE HEALTH PROMOTION: SOME EXAMPLES

Work-site promotion is becoming an all the more important strategy through which corporations and other employers try to act socially responsible in the sense of generating social improvement by employees. Many major international corporations have developed work-site health promotion programs in order to address "unhealthy employee behavior". The European Agency for Safety and Health at Work (2004) commissioned a report on the relationship between work-site health promotion and CSR in the European Union [6]. The report presents eleven in-depth case studies of European corporations that have integrated their health-promotion activities in their overall CRS-agendas. In the report it is made clear that good worker health belongs to the social responsibilities of companies and can be regarded as an integral part of CSR. Overall, the report takes a very positive view on CSR and proposes a number of ideas of how corporations should work more intensely with this concept:

Corporate social responsibility is an inspiring, challenging, and strategically important development that is becoming an increasingly important priority for companies of all size and types. Health and safety at work is an essential component of CSR. Companies need to project a positive image to the public and to potential employees, as well as to investors. In this respect, health and safety is an important dimension of CSR.

In Sweden, there are numerous cases of work-site health promotion as a means to exercise CSR. For instance, in the Swedish multinational packaging company Tetra Pak's Sustainability report (2007) it is stressed that the organization focuses on 'sustainable health' as part of the company's CSR strategy that is to be realized at the local work-place. Activities to promote employees' health include health profiles, where employees' lifestyles are screened by professionals, health and fitness programs, burnout programs and so-called health promoting leadership [4].

Indeed, health promotion is not only regarded as a vital CSR-activity by a growing number of corporations. National and international legislators demand that corporations act socially responsibly through health promotion. For instance, the World Health Organization (2007) pressured the need for corporations to act socially responsibly in terms of promoting employees' health: "The development of the health promoting workplace will be a prerequisite for sustainable social and economic development". In a similar vein The Luxembourg Declaration on Workplace Health Promotion in the European Union (2007) emphasized that health promotion is "a modern corporate strategy" vital to companies' social legitimacy and effectiveness. As part of corporations' CSR they aim to contribute both to productivity and to social legitimacy.

In Mongolia, there are several cases in whole business area of work-site health promotion as a part of CSR. For instance, in the Erdenet Mining Corporation's (EMC) 'Corporate Social Responsibility Report' (2007, 2008, 2009, and 2010) which has been presenting since 2005, emphasized that the company focuses on programs such as work place sanitary, employees' health and well-being, food, physical training, culture and arts which indicating "sustainable health" as part of the company's CSR strategy. Employees of EMC were very concerned with their health and most of them argued that their health depends by themselves in terms of work site health promotion activities. In addition, EMC plays the main role in the local or national developments: education, public health, big time sports, culture and arts, social welfare, donation, etc.

Peruvian corporations have already implemented a variety of employee health programs and these studies revealed that many employees were complacent about their health and did little to maintain or improve their health status. While many companies are taking important steps to address health issues, there are opportunities for employees to improve their life style and health behaviors and for corporations to provide important preventive health activities and develop more integrated healthcare interventions.

Consistent with the definition of health promotion as behavior promotion, in the health promotion discourse there is an ambition not only to define 'health' in regular medical terms, but also to draw on such psycho-social concepts as activity, function, behavior and attitude, i.e., factors of great interest to the production and re-production of organizational goals and standard operating procedures. This follows on health promotion programs being primarily concerned with employees' behavioral potentials, i.e., their ability to carry out various activities in particular ways, i.e., according to certain organizational norms and needs. According to this perspective work-site health promotion can be understood as a mechanism of corporate social control through which organizations enacts desired environments in terms of human behavior, thus fulfilling an intention to act responsibly through social betterment [4, 11, 12].

CONCLUSIONS

Health promotion may be a particularly important mechanism of corporate social control since this practice targets the very foundation of a human's personal condition – sickness or health; disability or fitness. No human being is exempt from health or non-health. Without classification and organization of the most basic human behaviors into medical concepts and labels, much human equivocality would remain, to the detriment of organized activity. Employees' health not only regarded as a bio-medical condition but also as social behavior, is a critical source of uncertainty to organizations that need to be controlled. By being integrated in regular CSR practice, health promotion can contribute to create the kind of employee behavior that the organization needs for its regular functioning and survival. Health is an important variant of organizational norm that requires a certain kind of behavior among employees and other actors in the organization's environment. In this way, health promotion can be regarded as a sublime and particularly effective means of social control that operate both psychologically and in terms of cultural values and norms. Therefore, health promotion may suggest a new and extended practice that enables corporations to increase their control over their employees' behavioral repertoire and create a certain line of desired way of acting by them.

Finally, these observations should be extended into systematic empirical studies that link corporations' efforts to adapt to their environments regarding institutional conditions, legislations, and national traditions regarding workers' health and wellbeing. Also, the unit of analysis in health promotion needs to be carefully discriminated because of compared to traditional occupational health activities that are focused on improving the general work-environment, most health-promotion activities are focused on individuals' behavior.

REFERENCES

1. Smith NC. Corporate Social Responsibilty: Not whether, but now? London: London Business School, Centre for Marketing, 2003 Contract No.: No.03-701.
2. Jenkins H. Corporate Social Responsibilty and the Mining Industry: Conflicts and Constructs. Corporate Social Responsibilty and Environmental Management. 2004;11:23-34.
3. Carroll AB. Corporate Social Responsibilty: Evolution of a Definitional Construct. Business and Society. 1999;38(3):268-95.
4. Holmqvist M. Corporate social responsibility as corporate social control: The case of work-site health promotion. Scandinavian Journal of Management. 2009;25(1):68-72.
5. Kapelus P. Mining, Corporate Social Responsibility and the "Community": The Case of Rio Tinto, Richards Bay Minerals and the Mbonambi. Journal of Business Ethics. 2002;39:275-96.
6. EASHW. Corporate social responsibility and safety and health at work. Luxembourg: Office for Official Publications of the European Communities, 2004.
7. Wheeler D, Fabig H, Boele R. Paradoxes and Dilemmas for Stakeholder Responsive Firms in the Extractive Sector: Lessons from the Case of Shell and the Ogoni. Journal of Business Ethics. 2002;39(3):297-318.
8. The Business Case for a Healthy Workplaces. Joan Burton2008.
9. Tones K, Tilford S, editors. Health promotion: Effectiveness, efficiency and equity. Cheltenham: Nelson Thornes; 2001.
10. Conrad P. The shifting engines of medicalization. Jounal of Health and Social Behavior. 2005;46:3-14.
11. Jenkins H, Yakovleva N. Corporate social responsibilty in the mining industry: Exploring trends in social and environmental disclosure. Journal of Cleaner Production. 2006;14:271-84.
12. McGuire JB, Alison S, Schneeweis T. Corporate Social Responsibility and Firm Financial Performance. The Academy of Management Journal. 1988;31(4):854-72.

PERSONALITY CHARACTERISTICS OF ALCOHOLICS IN MONGOLIA

Gantumur D.[1], Oryol N.[2], Nasantsengel L.[2]
[1]*Administration Voluntary Treatment for Drug and Alcohol Addiction*
[2]*School of Medicine of HSUM*[2]

ABSTRACT

Our study aims to determine the structure of personality traits in alcoholism and find out about pathopsychological manifestations.

Individuals seeking treatment for alcohol use disorder (n=203; 11 females) were recruited from the National Center of Mental Health of Narcology Department, Narcology Hospital of Metropolitan Health Administration in Mongolia. All participants were between the ages of 25-61 years at the time of study, and all met the diagnostic and statistical manual of mental disorders fifth edition (ICD-10) criteria for alcohol dependency.A screening test for revealing alcohol dependency was conducted for 203 alcoholics. A study was conducted for the assessment of personality characteristics using Eysenck Personality inventory (EPI) on 203 alcoholics, and Cattell's 16 PF questionnaire on 80 alcoholics.

The average age of all 203 alcoholicswho participated in the study at the first, second and third stage was 35, 40 and 46 respectively.According to the definition of alcoholism MAST test, 99% of all them are inpatients, by the AUDIT 92% of all of them are inpatients and by CAGE 93.6% of them are dependent on alcohol.For A =4.56, the patient is quitecoldand formalin the contacts, critical, and are usuallydifficult in getting alongwith people. When B = 3.86, the patient is different in concrete thinking, has difficulties in solving abstract problems, and slow trains. If Q1 = 6.3, a person is conservative, and does not like changes. For O = 7.1, the patient copes poorly with life's difficulties and experiences. When Q3 = 4, the patient tends to have a weak will and shows a lack of self-control behavior.

The risk of alcohol dependency includes emotional retardation and is related to intelligence factors. Alcoholics were more agitated and anxious in second and third stages.

Key words: alcoholics, personality characteristics, neurotics, primary factors, conservatism

INTRODUCTION

Alcoholics is a term of long standing use and variable meaning generally taken to refer to chronic continual drinking or periodic consumption of alcohol which is characterized by impaired control over drinking, frequent episodes of intoxication, and preoccupation with alcohol and the use of alcohol despite adverse consequences.[1]A study on alcohol dependency, conducted by the Center of the Mental Health and Narcology in 2006, indicated that 13.6% of adults were classified as alcohol dependent in 10000.[2]Research suggests that the tendency to addiction (and this includes alcoholism) goes along with certain personality characteristics.[3]

Such concerns render particularly interest as a study by Fuller who reports that the 16 PF profiles of male alcoholic patients resemble the 16 PF profiles of neurotic patients more than they do those of patients diagnosed as psychopathic, sociopathic, or drug addicted, with whom they are often grouped diagnostically.[4]There are considerable differences of opinions in the literature regarding the existence, and if so, the identification of an alcoholic personality profile.[5]

Individuals seeking treatment for alcohol use disorder (n=203; 11 females) were recruited from the National Center of Mental Health of Narcology Department, Narcology Hospital of Metropolitan Health Administration in Mongolia. All participants were between the ages of 25-61 years at the time of study, and all met the diagnostic and statistical manual of mental disorders fifth edition (ICD-10) criteria for alcohol dependency.[6] Screening tests such as MAST[7] (Michigan Alcohol Screening Test), CAGE (Cut Down Annoyed Guilty Eye opener),[8]and AUDIT (Alcohol Use Disorder Identification Test)[9] were applied for revealing alcohol dependency of 203 alcoholics.

A study was conducted for the assessment of personality characteristics using Eysenck Personality inventory (EPI) on 203 alcoholics, and Cattell's 16 PF questionnaire on 80 alcoholics.The average ages of all 203 alcoholics who

***Corresponding author:**
DalkhsurenGantumur
Administration Voluntary Treatment for
Drug and Alcohol Addiction of Mongolia
Tuvaimag, Baen sum
Phone: 99251768, 99280169
Fax: +976-02-244127
E- mail: gantumur579@yahoo.com

participated in the study at the first, second and third stage was 35, 40 and 46 respectively.24%, 65% and 11% of all patients were surveyed at first, second and third stage respectively. According to the definition of alcoholism through the MAST test, 99% of all of them are inpatients, by the AUDIT 92% of all of them are inpatients and by CAGE 93.6% are dependent on alcohol.The respondents had received 41.4% secondary education, 38.4% high education, 16.7% have completed college, and 3.4% have completed primary school education.

Table 1

Values of EysenckPersonality Inventory:Neuroticism, Extraversion, Validity scales (n=203)in reference to stages

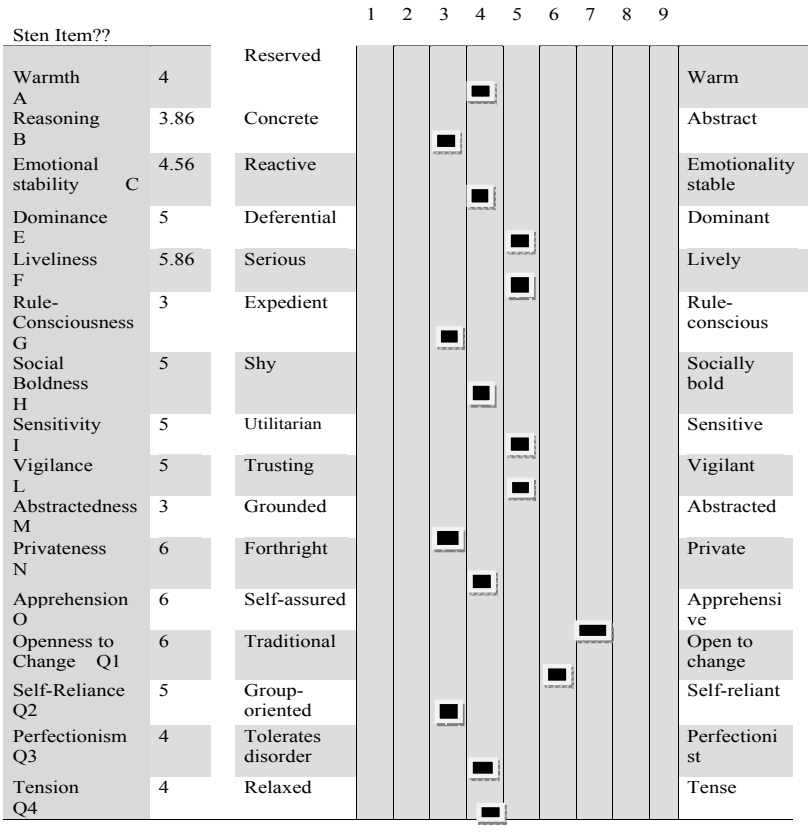
Profile	Stage	Patients (N)	Mean	SD	Min	Max	95% CI max	95% CI min
Extraversion	**I**	**45**	**11.3**	**3**	**4**	**18**	**12.2**	**10.4**
	II	132	11.6	3.3	4	17	12.2	11.1
	III	22	11.5	3.7	4	17	13.2	9.88
Neurotics	**I**	**45**	**13.1**	**5.6**	**2**	**24**	**14.7**	**11.4**
	II	132	14.2	4.8	1	23	**15.1**	13.4
	III	22	15.5	4.5	3	23	17.5	13.5
Validity scales of Eysenck	**I**	**45**	**1.51**	**0.6**	**1**	**3**	**1.7**	**1.3**
	II	132	1.27	0.5	1	3	1.3	1.1
	III	22	1.23	0.5	1	3	1.4	1

Table 1shows that the arithmetic means for extraversion at first stage alcoholics are 11.3 and are 13.1 for neuroticism (Mean=13.1±5.6; 95% CI [14.7-11.4]),and are (Mean=13.1±1.6; 95% CI [14.7-11.4]).Extraversion and validity scales of the Eysenck testshave beenhad nodistinguishing features for the stages of alcoholism.

16 PF test provides a personality profile rating of each subject on a 10-point scale for 16 bipolar factors of 80 alcoholics. This interaction effect is likely to be particularly true forthe 16 PF item 1 and 4 scores in the mid-range of the profile (Validity scales of thePF)(seetable 2).

Table 2

Primary factors (16 personality factors) in 80 alcoholics



The above presented table 2 explains16 personality factors as follows:

For A =4.56, the patient is quitecoldand formalin contacts, critical, and usuallyare difficult in getting alongwith people. The subject may beinsufficient flexible and notsociable andhave little interest inthe lifeof others.The extremely lowscoresuggeststhat theperson is notjustintroverted, but generallyafraid of peopleand seeks toavoid them.

For B = 3.86, the patient is different in concrete thinking, has difficulty in solving abstract problems, slow trains.

For M = 3.5, a person is sane, is guided by reality, well-versed in everyday situations, correctly solves practical problems and as a rule, does not have broad intellectual aesthetic interests.

If Q1 = 6.3, a person is conservative, and does not like changes, prefers well-established ideas, opinions, and ways of action, and respectstradition, appliessomething new with great caution, and sometimes takes a hostile reception, may be prone to moralizing and "reading of morality",takes the position of the slave in compliance with the chain of command, and has not tendency to take the initiative and ingenuity.

For C =4.35, the patient is emotionallyunstable, has poorcontrol overtheir emotionalimpulses, may have difficultywith an appropriate(socially acceptable) expression, oftenfeels tired,helpless, and unableto copewith life'sdifficulties.Externally,it canmanifest asmoodiness,evasion ofrealityand an unwillingnessto take responsibilitythat adverselyaffects theadaptation ofthe individual andthe success ofpsychotherapy.

When Q3 = 4, the patient shows a weak will and lack of self-control behavior, does not tend to plan their lives, has difficultywith the organization of his/her own time and setting the order for doing things. The extremity of this pole usually is accompanied by increased anxiety caused by the impulsive and inconsistentbehavior.

For O = 7.1, the patient copes poorly with life's difficulties. The person tends to have an alarming depressed mood and a feeling of sadness,does not believe in him/herself, tends to self-reproach, and is prone to underestimate their capabilities; mood and self-esteem are strongly dependent on the approval or disapproval of others. The person needs care and attention from others and has a strong sense of duty in connection with a tendency to feel guilty.

DISCUSSION

While thefactorsC, Q3, Gtestsrevealed16factors thatcoincided with theresults of the studyfrom Derech(2005),[12] factors A, B, M, foundin our studyshow thatthe dominance ofmentalpropertieschangewith respect tointellectand emotion.Mongoliashouldtake this into accountin psychotherapyand treatment and prevention. Results of the studyfrom Zykov(2010)[13]proveda high senseof feeling guilty andan emotionalinstabilityin patients with alcoholism, which also goes along with the resultsof our study.

51%of all patientswho participated in thestudyhad a cholericand25% a melancholictemperament. These findingsalso go along with the conclusions ofthe studyofStrel'chuk(1979),[14]who stated the dominance ofmenwiththesetemperamentsfor alcoholism.

McCauleyOhannessian&Hesselbrock[15]believed thatpersonaldata aremental propertiesanddo not contribute tothe disorder of alcoholism.On the otherhand, wedo not rejectthe views ofresearcherssuchasMcKay(1999),[16]who findsit impossible to determinethe statusof commonmental traitswhen it isdistorted.

According to the research of McCauleyOhannessian&Hess elbrock(1999),[15]compared to the overall patient population, substance abuse patients are more characterized bybeing extroverted while introverted people are much higher among patients with endogenous mental illnesses. All patients who participated in our study, in all stages of the disease, were mostly located between introversion andextraversion.

CONCLUSIONS

The risk of alcohol dependency vulnerable with L+ (suspicious), O+ (the tendency to feel guilty), Q1+(the tendencytoconservatism),andQ3(poorself-controlbehavior Denia).Neuroticismatstage I,the arithmetic mean of13.1 ± 2.6,at stage IIin14.5 ±3 atstage III-15.5 ± 4.5, and it (the awakening, anxiety) predicted morevariancein thephysiologicalindicatorsof sensitivitythan eitherthe severityof alcohol dependenceor the number ofalcoholicbeverageconsumption.

RECOMMENDATIONS

In the treatment and psychosocial rehabilitation of alcoholics, differentiated means of treatment and support according to the personality structure of alcoholics should be applied.Recommendedare primarily mood stabilizers and emotional response, mentors and models and situational training and cognitive-behavioral therapy.

REFERENCES

1. World Health Organization. Lexicon of alcohol and drug terms.Geneva. 1994;34.
2. Ministry of Health of Mongolia. Epidemiological study on prevalence of alcoholism in Mongolia. Ulaanbaatar. 2006.
3. Landgren S, Berglund K, Jerlhag E, Fahlke C, et al.Available from: online journal. http://www.pubmed.com/.
4. Golightly,C&Reinehr, RC. 16 PF profiles of hospitalized alcoholic patients. Psychology reports. 1969; 24:543-545.

5. Connors Fagan, E. Personality characteristics of alcoholics, with varying degrees of sobriety, and those of their wives. Gottesman Libraries Archive, Historical Dissertations. 1970.
6. World Health Organization. International Classification Diseasesof Mental and Behavioral Disorders.Fifth edition. 2004.
7. Teitelbaum, L &Mullen, B. The Validity of the MAST in Psychiatric Settings. J Stud. Alcohol Drugs. 2: March 2000 [cited 2010 jul 4]; 61:254-261. Available from: http://www. Al-drugs.com.
8. Liskow, B, Campbell, J&Elizabeth J. Validity of the CAGE Questionnaire in Screening for alcohol Dependence in a Walk-in Clinic. J Stud. Alcohol Drugs. Available from: http://www. Al-drugs.com.
9. Bohn, MJ &Babor, TF. The Alcohol Use Disorders Identification Test: Validation of a Screening Instrument for Use in Medical Settings. J Stud. Alcohol Drugs. Available from: http://www. Al-drugs.com.
10. SathyanaravanaRaoT. S., Kuruvilla, K. A study on the personality characteristics of wives of alcoholics. Indian J. Psychiatry. (1991), 33(3), 180-186.
11. Cattell, R. Reliability and Validity of 16 Personality Factor. Available from: onlinejournal. http://www.psychcorp.pearsonassesments.com/HAIWEB/
12. Darech, G. Psychopathology and personality disorder pathopsychology in patients with alcoholism. Dissertation for the degree candidate of medical sciences. Muscovy. 2005.
13. Zykov,O. Prevention pathological form addictive behaviors [Treatment subculture: Technology prevention recidivism]. Moscow. 2010.
14. Strel'chuk,I. Psychosis of intoxication. Moscow. 1979.
15. McCauleyOhannessian, C&Hesselbrock, VM. Temperament and Personality Typologies in adult Offspring of Alcoholics. J Stud. Alcohol Drugs.56:318-327. Available from: http://www. Al-drugs.com.
16. McKay, J.R. Studies of Factors in Relapse to Alcohol, Drug and Nicotine Use: A Critical Review of Methodologies and Findings. J Stud. Alcohol Drugs [abstract]. Available from: http://www. Al-drugs.com.

HUMAN RESOURCE SUPPLY OF HEALTH CARE WORKERS OF THE KHANGAI REGIONAL AIMAGS

Munkhtuya.Ts[1], Otgonbayar.R[2], Chimedsuren.O[3]
[1]Department of Evaluation and Monitoring HSUM,
[2]Medical School of HSUM,
[3] Public Health School of HSUM

ABSTRACT

To assess the current supply of health care workers who have been working at the general hospitals of the aimags and define the further needs.

In this study, we collected data from 185 health care workers who have been working in the Soum aimag hospitals of Bulgan, Arkhangai, Selenge, Khuvsgul, and Orkhon aimags. A document review was done of health reports and indicators of the health department from 2006 to 2010, which included the annual report of the general hospitals with their standards for structure and operation of those aimags. Data was analyzed by SPSS-17. Descriptive statistical analysis was conducted to calculate the prevalence, mean, and hypothesis regarding the study goal. The objective was analyzed by statistical analytical methods (T, x^2, Fisher exact) measuring the differences of the groups, and verifying the statistical significance .

Nationwide, there are 27.18 medical doctors per 10,000 people. However, at the aimag level, there were only 18.03 medical doctors per 10,000 people working in 2010. The study results of our target aimags showed that there were 29.13 medical doctors per 10,000 people in Orkhon aimag, 14.56 in Bulgan aimag, 14.78 in Arkhangai aimag, 15.33 in Selenge aimag, and 14.07 in Khuvsgul aimag. Those figures are lower than the national average and the general aimag average. There are 31.7 nurses per 10,000 people, and an average of 57.38 medium level medical personnel, including nurses, per 10,000 people(1).

In terms of the number of physician per 10,000, Mongolia has reached the level of developed countries. However, the study results showed that there is a lack of medical doctors in rural areas, especially in remote areas, due to short-sighted planning and allocation of human resources in the health sector.

Key words: Health care workers, human resources, needs, ration of medical doctors and nurses

INTRODUCTION

The mission of the state health sector is to provide accessible and qualified health care service to the population. The main function of the health sector is to deliver essential health care services to individuals, families, and communities, and to provide public health services to the total population. Every citizen has the right to protect his or her health and to receive health care, as stated in the Mongolian Constitution, and that laws providing medical care to citizens should be regulated within a legal framework(2).

***Corresponding author:**
Munkhtuya Tseveenmyadag
Department of Evaluation and Monitoring HSUM
Sukhbaatar district, S.Zorig street-210648
Phone: 70111372, 99080077
Fax: 11-70120077
E-mail: ts_mtuya2000@yahoo.com

The capacity to develop our human resources in the health sector is very important for strengthening the health care system, improving the quality of health care services, and expanding public health services to the population. There is a public health care demand requiring that we direct our human resources to train for different medical specializations in line with present health policy and needs. That demand also requires that our efforts be focused on recruitment after that specialized training from medical universities, and the subsequent placing of the health care workers in areas where they are needed. Since 1990, the health system has changed, making the need for review of our policy on human resources in the health sector more crucial. Planning the use of human resources in the health sector so that it is in line with the present demand for health care services in our population, is reflected as a priority in our policy for the development of human resources; however, it has not been implemented yet. In 2009, the

Department of State Administration and Management, Ministry of Health conducted a study assessing the needs of, and planing for, health care workers until 2020. The demand of the human resource was defined by the need. Based on the requirement, a document of the policy for developing the human resources of the health sector for 2010-2014 was approved by the Health Minister's order numbered 443 in 2009 [3, 4].

An extensive number of medical doctors are being prepared; however, with inequitable location and allocation of health care workers, there is a lack of human resources in rural remote soums. The Organizational and Operational Standards for Aimag Hospital, which was endorsed by order number 77 on 29 November 2001 and became effective on 15 December 2001, stated that the number of medical doctors and nurses should be 39.5 per 65,500 people, 50 per 65,500-90,500 people, and 58.5 if the population is over 90,500. It stated that the lowest number of medium level medical personnel should be 32 or 33, of which, 9 should work in outpatient departments, and the number of non-medical personnel for inpatient departments should depend on the number of inpatient hospital beds [5, 6].

The planning of human resources should depend on the density of the urban and rural populations. Still there is a lack of human resources in remote bags and soums of the Khangai region due to inequable planning and allocation of the human resources of the health sector. The number of medical doctors per 10,000 people is high in Mongolia; however, we conducted this study to find the reason for the lack of medical doctors in rural areas.

Purpose and Objectives

To assess the current supply of health care workers who have been working at the general hospital of aimag and define the further needs.

1. To assess the supply of health care workers who have been working in the Khangai regional aimags.
2. To define the further needs for human resources.

MATERIALS AND METHODS

The study was conducted by an institution-based, cross-sectional study. Data was collected by qualitative and quantitative methods. Questionnares were completed by 185 health care providers and health care workers employeed at the general hospitals and soums of Bulgan, Arkhangai, Selenge, Khuvsgul, and Orkhon aimags. A document review was done of the health reports and indicators from the health department for 2006-2010; a study of the needs of health care workers (2009-2020), and an annual report of the general hospitals, including the standards for structure and operation of those aimags. The data was analyzed by SPSS-17[7]. A descriptive statistical analysis was conducted to calculate the prevalence, mean, and hypothesis regarding the study goal, with the objective being analyzed by statistical analytical methods (T, x^2, Fisher exact). The differences of the groups and statistical significance was verified[8].

RESULTS

The total number of physicians was 39,608 in 2010, of which, 15,828 were medium level medical personnel, 9,179 were nurses, 1,176 were pharmacists, and 7,497 were medical doctors. A total of 82.3% of health care workers are female, and 78.95% of medical doctors are female. In 2002, 6,823 medical doctors were working, but, this figure increased to 7,497 in 2010 [2, 9].

Table1. Number of health care workers

Type	Number of beds	Medical doctors and pharmacist	medium level medical personnel	Other staff	Number of population of respective areas	Number of population per physician	Number of medium level medical personnel per medical doctor
National average	64.61	27.18	57.38	143.60	2,780,757	367.92	2.11
General hospital of Orkhon aimag	50.92	29.13	62.41	137.96	85,742	343.27	2.14
General hospital of Bulgan aimag	59.21	14.56	57.93	123.86	62,637	686.69	3.98
General hospital of Arkhangai aimag	60.73	14.78	54.87	121.58	91,633	676.77	3.71
General hospital of Selenge aimag	61.53	15.33	50.77	107.22	106,525	652.12	3.31
General hospital of Khuvsgul aimag	49.70	14.07	55.81	111.94	124,348	710.56	3.97

Data taken from the Health indicator, 2010

A total of 31.7% of the human resource in the health sector was administrative and management department staff. Nationwide, there were 27.18 medical doctors per 10,000 people; and at the aimag level, there were 18.03 medical doctors per 10,000 people in 2010. The study results of our target aimags showed that there were 29.13 medical doctors per 10,000 people in Orkhon aimag, 14.56 in Bulgan aimag, 14.78 in Arkhangai aimag, 15.33 in Selenge aimag, and 14.07 in Khuvsgul aimag. Those figures are lower than the national average and the aimag average. There are 31.7 nurses per 10,000 people, and 57.38 medium level medical personnel, including nurses, per 10,000 people[1].

The number of physicians of the Regional Center for Diagnosis and Treatment has reached the same standard level as the general hospital of Orkhon aimag; but, if compared to 3rd level hospitals, the number of physician at the Regional Center is still lacking. However, there are no standards for the Regional Center for Diagnosis and Treatment on the number of health care workers. There is a lack of medical doctors in specialties that include: cardiology/cardiovascular disease, urology/nephrology, endocrinology, gynecology, and pediatrics in the outpatient department. During a focus group discussion, medical doctors of the Regional Center commented that there is a need to increase the number of medical doctors, stating that they do not have enough time to see patients and give consults because of the heavy workload and the long line of patients/consumers waiting to be seen in the outpatient department.

The below table shows the ratio of human resources in the health care sector by selected target aimags and the national average.

Table 2. Ratio of human resources in the health sector

Year/ occupation	1960	1970	1980	1990	2002	2010
Number of physician	873	2,920	3,685	6,180	6,823	7,497
Number of nurse	2,905	4,220	6,836	11,295	7,802	9,179
Ratio	3.33	1.87	1.85	1.83	1.22	1.22

The number of physician was 8.6 times higher in 2010 than it was 1960. The number of physician was stable from 1990 to 2010, but, the number of nurses rose to their maximum level in 1990, and after that, their numbers have gradually decreased. The number of nurses was 3.1 times higher in 2010 than in 1960. In recent years, the number of physician has increased while the number of nurses has gradually decreased. That put the ratio of physicians to nurse at 1.26, which is 3.3 times lower than in 1966.

The ratio of physicians to nurses was 1:2 in Orkhon aimag, which is higher than the national and aimag averages. This ratio was 1:3 in the Bulgan, Arkhangai, Selenge and Khuvsgul aimags, which is lower than the national average and international practice.

Postgraduate training in various medical specialties is continuing at medical universities and tertiary level hospitals of Ulaanbaatar city. Recently, 23 institutions have been organizing postgraduate training in Mongolia. Public health training is conducted with the support of development agencies; for example, training on reproductive healh, HIV/AIDS prevention and control, and an expanded immunization program is being conducted for health care providers, including medical doctors who specialize in the treatment of communicable diseases. Participants of the focus group discussions concluded that there has been limited training organized for general practitioners and family medicine doctors.

The study findings of the needs for continuing postgraduate training, showed that 40% of medical doctors and health care workers who have been working in the 5 study target aimags wanted advanced and specialized training, and to participate in local and international fellowships and other short and long term trainings. The figure shows the training needs and planning by individual institutions of those medical doctors who participated in the study.

Figure 1. Training institutions where medical doctors wanted/planned to pursue postgraduate training (%)

Many of them wanted to study at the HSUM. During the focus group dicussion, they commented that many of them wanted to study in foreign countries, but they can not afford the cost by themself. Respective institutions and hospitals can not send their staff for postgraduate training as they have limited state budget funds for training. Besides that, the duration of the training courses limits the number who can take leave for the longer training. During field study and focus group discussions, we found that some hospitals have received new or advanced equipment, but there are limited personnel trained on know how to use such equipment.

Existing training needs are defined below:

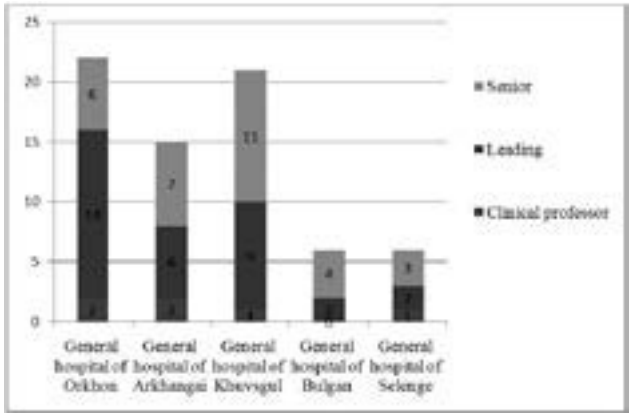
– higher level specialized training
– advanced training

- training and experience using modern and advanced diagnostic equipment
- foreign language training
- communication skills and medical ethics training.

Their requirements and interest to improve their commincation skills and attitude was raised during the focus group discussions.

During the past few years, the number of medical doctors passing their advanced and first degree exams has increased. Such exams are a part of the continuing training. A total of 12.7% of medical doctors and 0.9% of medium level health care personnel have an advanced degree which is lower than the expected level. Figure 2 shows the number of medical doctors who have advanced and first degrees, and the clinical professors in the targeted 5 aimags.

Figure 2. The number of medical doctors noted by aimags.



The number of medical doctors with advanced and first degrees was lower in Selenge and Bulgan aimags than the others.

Figure 3. Medical doctors of general hospitals of five aimags by employment years in respective specializations

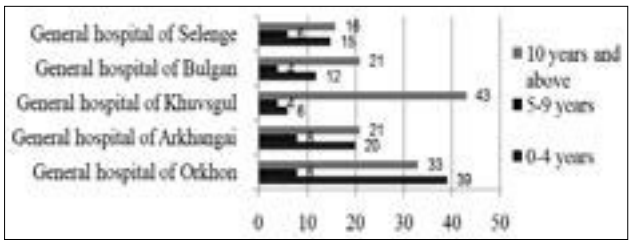


Figure (3) shows the years of employment for medical doctors who have been working in respective specializations at the general hospitals of the selected five aimags. Over 50% of the medical doctors were well experienced and have been working for over 10 years. Particularly in Khuvsgul aimag where 79.2% of the medical doctors have been employed for over 10 years at the aimag hospital.

DISCUSSION

The main findings of our study are the same as other study results. We found there is a sufficient number of medical doctors, however, there is still a lack of medical doctors trained in forensic medicine, pathological anatomy, and genecology. There is also a lack of X-ray technicians and laboratory assistants in those selected aimags. The number of physicians and nurses relative to the population is higher than the overall average in Mongolia, however, the number of physician trained in respective specializations has not reached the internationally recommended level .

The ratio of physicians to nurses in Mongolia was 1:1.2, which is lower than the internationally recommended level. In Mongolia, the number of physician per 10,000 people is 26, and the number of nurses is 32. The number of physician per 10,000 people in the Former Sovet Union Countries is higher than the internationally recommended level, but the number of nurses is lower. For example,there are 35 physicians and 38 nurses per 10,000 people in Bulgaria, 20 physicians and 40 nurses in Romania, and 36 physicians and 63 nurses in Kazakstan. The study findings for the number of physicians and nurses in Mongolia showed that there are too few nurses for the number of medical doctors.

Internationally, 70% of medical doctors received on-site training; in Mongolia, this figure was much lower. After graduation and receiving a bachelor degree, only a small percentage of the medical doctors who work in rural areas participated in postgraduate or on-site continuing training. Only twenty five per cent of the medical doctors who received post-graduate training at HSUM, have had additional training in the rural remote areas where they work. One of the problems stems from increased immigration to urban areas which has led to limited human resources in rural areas[11].

The national average was 368 persons per physician, 248 average in Ulaanbaatar city, and 555 average in the aimags. The number of people per physician was higher in the study target aimags including: Orkhon (343), Bulgan (686.7), Arkhangai (676.7), Selenge (652), and Khuvsgul (710). This is greater than the internationally recommended level of 500 persons per physician.

CONCLUSION

1. In 2010, there were 27.18 physicians per 10,000 people nationwide, and 18.03 at the aimag level. The number of working physicians per 10,000 people was lower in the study target aimags including: 29.13 medical doctors in Orkhon aimag, 14.56 in Bulgan aimag, 14.78 in Arkhangai aimag, 15.33 in Selenge aimag, and 14.07 in Khuvsgul aimag. The ratio of physicians to nurses was higher in Orkhon

aimag at (1:2), but lower in the other five aimags. The ratio was 1:3 in Bulgan, Arkhangai, Selenge, and Khuvsgul which is lower than the internationally recommended level.

2. Mongolia has reached the internationally recommended level of physicians per 10,000 people; however, there is still a lack of medical doctors in rural remote areas because of misplanning and enquitable allocation of human resources in the health sector. The study findings of the need for continuing postgraduate training showed that 40% of medical doctors and health care workers who have been working in the 5 study target aimags wanted additional specialized and advanced training, and they wanted to participate in local and international fellowships and other short and long term training. The study results recommended that we expand the opportunity for health care workers to receive advanced training at the Regional Center for Diagnosis and Treatment, and the General hospitals of the aimags to align their training with the needs of those they serve in the rural areas of Mongolia.

REFERENCE

1. Government of *Mongolia. Ministry of Health.* Health Sector Strategic *Master. Plan*. 2006-2015. Volume 1. Ulaanbaatar. 2005.
2. Minister of Health. Third Health Sector Development Project. Review of the Mongolian Health Sector Human Resources Development Policy and Forecast Workforce Plan. 2011
3. Human resource Managenment in Hospital. Hospital standards for accreditation for Afganistan
4. Mongolian National Standard for General hospital of aimag. National Standardising Center of Mongolia 2001.
5. State Implementing Agency Health Government of Mongolia. Health Indicators 2010.
6. World Health Organization. Health Research Methods – 2, 2001
7. Batzorig B, Khuderchuluun N, Ganchimeg U, Ser od Kh, Bilegt M. Biostatistics Davaalkham D, editor 2011.270p.
8. Minister of Health. Synthesis paper 2ed 2004
9. Minister of Health. Human Resources Development Policy of the Health Sector for 2010-2014. Ulaanbaatar 2009
10. Riley PL, Zuber A, Vindigni SM, Gupta N, Verani A, Sunderland NL, Friedman M, Zurn P, Okoro C, Patrick H, Campbell J. Information systems on human resources for health: a global review. 2012 Apr 30;10(1):7. PMID: 22546089
11. Asante AD, Negin J, Hall J, Dewdney J, Zwi AB. Analysis of policy implications and challenges of the Cuban health assistance program related to human resources for health in the Pacific. 2012 May 6;10(1):10. PMID: 22558940.

THE STRUCTURE OF INTERNAL BLOOD VESSELS IN MONGOLIAN FETAL VERTEBRAL BODIES

Oyuntsetseg D. [1], **Avirmed A.**[2], **Enebish S.** [2], **Amgalanbaatar D.** [2]
[1]*Department of Anatomy, Medical College, Gobi-Altai province*
[2]*Department of Anatomy, Health Sciences University of Mongolia*

ABSTRACT

Investigate specific characteristic of blood supply of fetal vertebral bodies

16-30 wk aged 20 fetuses (10 male, 10 female) were used for the study. Norms and requirements of Bio-Medical Ethics have not been violated in the use of human material in the study. Black-ink perfusion and cast of substance absorbing x-ray were applied in the fetuses.

Three concentric zones could be distinguished in the vascular architecture of the fetal vertebral bodies: (1) the peripheral zone of perichondrial vessels, (2) the intermediate zone of radial vessels and (3) the central zone of the ossification centre vessels. We used black-ink perfusion and cast of substance absorbing x-ray were applied in the fetuses. *Periosteum* of fetal vertebral bodies are distributed originating from fine arteries of 70-120 diameter and arterioles of 30-50 diameter which are part of arteries of network of micro blood circulation. Venules are followed along two sides of this arteriole and short precapillaries are branched out in tree-like manner from it forming capillary network surrounding arteriole and capillary plexuses. Postcapillaries branched from the network are being emerged the venules accompanied arterioles.

Micro blood circulatory system of the vertebrae has angion structure. The peripheral zone of perichondrial vessels has combined blood supply surrounded by blindly ending capillary network drained up and down from the central zone. The central zone of vertebral body is supplied with blood by the main arteriole.

Fetus, vascularization, spine

INTRODUCTION

The vascularization of the human spine has been the subject of anatomical and micro anatomical studies for almost a century. Attention has mostly been focused on the external segmental blood supply and drainage of the vertebral bodies. [1,2] Only a few papers have described the intraosseous arteries of the vertebral bodies in detail.[3,4,5,6] Among more recent studies, a comprehensive description of both extra- and intraosseous vessels of the vertebral bodies was presented.[7,8,9,10,11] The latter author proposed the most convincing classification of the intraosseous arteries supplying the vertebral body, dividing them into (1) the equatorial arteries, including the nutrient arteries originating from the postcentral longitudinal anastomosis and 2 anterolateral arteries arising from the segmental artery, (2) the metaphyseal, radially disposed arteries arising from the periosteal vascular network and (3) short, centripetal peripheral arteries originating from the same source. Almost all authors studying the vascularization of the vertebral bodies employed x-ray angiographic methods which have not permitted visualization of the capillary networks due to the high density of the contrast media. To investigate the situation there were used black-ink perfusion and cast of substance absorbing x-ray. The latter method offers complete visualization of the vascular system, significantly higher resolution and quasi-3-dimensional images which are especially useful in the investigation of the microvascular architecture. [12,13] It was occasionally used for investigating the vertebral vasculature in animals including the rat and rabbit, but never in human material.[14,15]

***Corresponding author:**
Oyuntsetseg Demed
Medical College, Gobi-Altai province
Chingeltei duureg,18 khoroo, Yargait 35-541
Fax: 976-11-319065
E-mail: Oyunaa8998@yahoo.com

MATERIAL AND METHODS:

16-30 wk aged 20 fetuses (10 male, 10 female) were used for the study. Norms and requirements of Bio-Medical Ethics have not been violated in the use of human material in the study. Black-ink perfusion and cast of substance absorbing x-ray were applied in the fetuses.

1. Black ink cast

To reach the goal of defining the microcirculation, there was the black ink cast method in some hearts. But it did not reveal information about the wall structure of the heart micro blood vessels. The angiography method was used in some hearts to determine the vitelline vein such

as a vertebral blood vessels and its derived branches. The first cut was performed at the level of vitelline vein. Then the cannulas were introduced into the vitelline vein. The great vessels were preventing black ink from flowing out of the vessels. Also the cannulas was put into the vitelline vein and were ligated tightly. Injection with a water suspension of black ink (1:3) was performed under mannometric control for 2-3 times. To improve the results, the ink was filtered three times prior to the injection. After the infusion procedure with black ink, the cannulas were removed and the vessels were ligated. After fixation in 10%formaldehyde for 21 days, dehydrated in alcohol 50^0, 60^0,70^0, 80^0, 90^0, for 48 hours and cleared in dimetillptalate for 72 hours the preparations were examined using a light microscope MBC-2. In this way the microcirculation of the vertebrae and intervertebral articulation were investigated.

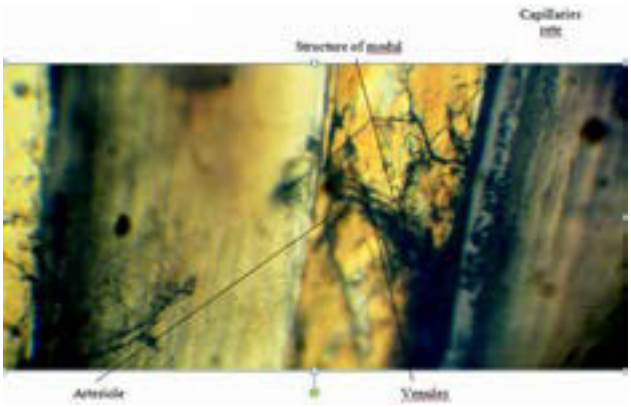
2. X-ray angiography method

The heart was isolated and immediately processed. The abdominal aorta opened, 2-3 glass cannulas were introduced into the lumbar arteries. The cannulas were ligated tightly in the abdominal aorta where the lumbal artery originated and connected to a plastic connector. One end of each tube was connected to a 10-ml syringe. The vascular system was perfused with 10 ml of 5% contrast media of (10.0 g glycerin, 1.0-2.0 g PIO_2) at 80-100 mm Hg pressure. (B. Dagdanbazar, B. Purevsuren). In some selected cases barium sulphate was used as the opaque media. Then X-ray films were take using the URD-110 X-ray unit. The methods of opening and taking X-ray films were first described by Reiner and Schlesinger. All the procedure were performed under the control of an X-ray technician.

RESULTS

Three concentric zones could be distinguished in the vascular architecture of the fetal vertebral bodies: (1) the peripheral zone of perichondrial vessels, (2) the intermediate zone of radial vessels and (3) the central zone of the ossification centre vessels. The perichondrial vessels formed a relatively narrow layer from which fine arterioles were sometimes seen emerging from the inner circumference, especially from the anterolateral surface of the vertebral body, and forming a shallow, centripetally directed arcade-like array. The radial arteries originated from the segmental arteries and their branches or from the perichondrial plexus. They were regularly distributed and in the sagittal view their blindly ending branches were directed towards the vertebral end-plates. The terminal segments of these vessels showed thickened, irregular contours. Occasionally, some branches seemed to communicate with the vessels of the ossification centre. The ossification centre was mostly supplied by 2 arteries of similar size originating from the spinal branches of basivertebral artery (postcentral anastomosis), entering the vertebral body from the posterior aspect and extensively branching into a lenticular network with a fan-shaped, centrifugal arrangement of the vessels. The intervertebral spaces and end-plate regions were completely devoid of blood vessels . terminated at the bone/ cartilage interface, forming blind buds or, occasionally, irregular loops. *Periosteum* of fetal vertebral bodies are distributed originating from fine arteries of 70-120 diameter and arterioles of 30-50 diameter which are part of arteries of network of micro blood circulation. Venules are followed along two sides of this arteriole and short precapillaries are branched out in tree-like manner from it forming capillary network surrounding arteriole and capillary plexuses. Postcapillaries branched from the network are being emerged the venules accompanied arterioles. However, in this micro blood circulation of vertebral body split film and ring shaped arrangement in the center of which capillary network should be localized, has not been seen clearly. It is observed that in few cases half of the module has been seen. (*Figure1*)

Figure 1 Photomicrograph of artery network in fetal vertebral body



DISCUSSION

The general architecture of the blood vessels present in the vertebral bodies of fetuses from the 2nd trimester shows the pattern observed by other authors. Although some observations of the fetal vertebrae were mentioned in works.[2,4,6] However, they investigated fetuses from the 3rd trimester and at term. It seems therefore that differences observed in the present study stem from the earlier stage of fetal development that was studied. In dye-injected specimens, the localisation and the mode of branching of the radial arteries permitted their identification as the metaphyseal arteries, according to the classification of Ratcliffe, while the occasional shallow arcades protruding from the perichondrial network correspond as far as their size and arrangement is concerned to the peripheral vessels. The equatorial vessels entering the vertebral body from an anterolateral direction and communicating with the vasculature of the ossification centre were found only rarely. [16]

Since the interconnections between the metaphyseal arteries reported by Ratcliffe could not be seen in our material, it seems that in the 2nd trimester these arteries are at the stage of ingrowth into the vertebral body cartilage. They become fully incorporated into the ossification centre about the 36th wk of fetal life.[10] Occasional arterioles entering the ossification centre from the periphery probably represent the antero-lateral equatorial vessels, sometimes seen also in dye-injected specimens. However, they did not occur consistently at the developmental stage investigated in this study, although they had been described in 7-10 mo old fetuses. [4,6,10] The fold-like capillary plexuses with their regular distribution around the inner perimeter of the vertebral body may be precursors of the later peripheral vessel system. Ratcliffe did not find peripheral arteries in his material but it seems that the development of peripheral vessels may just begin in the 2nd trimester, albeit only in some local sectors. The vasculature of the ossification centre clearly shows that the posterior vessels are mainly, if not exclusively, responsible for the supply and drainage of the centre in the 2nd trimester. In our material, most of the vertebral bodies had 2 nutrient arteries, while the others were supplied by just 1. These results are in agreement with the observations of Ratcliffe . The presence of arterial sphincters has not yet been reported in the intraosseous vasculature of human vertebral bodies, but such sphincters, both arterial and venous, were described in the rat.[14] The appearance of the capillary vessels at the advancing border of the ossification centre is similar to that of the 'vascular besom' described by us in corrosion casts of the femoral vessels directed towards the metaphyseal plate and it seems to be a typical arrangement of capillaries at the bone/cartilage interface in the ossification areas.[16] The internal venous system of the fetal vertebral bodies generally followed the course of the arteries, as also seen in adults, although some specific venous arrangements such as the subchondral network and the horizontal collecting vein of the endplate region described by Crock et al have not yet been developed.[7,8]

Only Ferguson mentioned the presence of blood vessels in the region of fetal end-plates and even of the annulus fibrosus. Our observations, however, agree with those of Guida et al and Ratcliffe who also found the end-plate area avascular. A striking observation was the axial avascular area in the centre of the vertebral bodies of the youngest fetus examined, corresponding to the location of the notochord and making the vasculature of the ossification centre ring-shaped. According to our knowledge, this is the first description of such vascular array in the fetal vertebral body. The notochord disappears completely on the turn of the 1st trimester, while the earliest ossification centres in the vertebral bodies have been observed as early as in the 8-wk fetuses .[17] It seems therefore that the ossification centre is first formed around the remnants of the notochord and later at the beginning of the 2nd trimester the vessels advance in both directions: centrifugally, increasing the size of the centre, and centripetally, invading the formerly avascular central region. The observed arterial arcades located medially to the advancing border of the ossification centre might be the manifestation of the initial ring-shaped arrangement of the centre. It can be speculated that the notochord cells may contain some angiogenesis-inhibiting factors acting locally on the developing vessels of the ossification centre. Delayed vascular penetration and, subsequently, ossification of that region can probably lead to such rarely occurring congenital malformations of the vertebral bodies as the persistent notochord canal or even cleft vertebral body. [18] Taken together, the observations on 2nd trimester fetuses (this study), 3rd trimester fetuses and infants (Ratcliffe) as well as adults (Crock, Ratcliffe,) suggest a biphasic development of the internal (intrachondral and intraosseous) vascular architecture of the human vertebral body. In the fetal and early infantile period, the vessels grow centripetally from the periphery and centrifugally from the ossification centre, until they meet and form an integrated, extensively anastomosing system. Afterwards, during late childhood and adolescence, the radial vessels are gradually withdrawn and the anastomoses disappear, dividing the vertebral body into separate compartments supplied and drained by individual arterio-venous pairs.

CONCLUSIONS

Micro blood circulatory system of the vertebrae has angion structure. The peripheral zone of perichondrial vessels has combined blood supply surrounded by blindly ending capillary network drained up and down from the central zone. The central zone of vertebral body is supplied with blood by the main arteriole.

REFERENCES

1. Harris RS, Jones DM, The arterial supply of the adult cervical vertebral bodies. *J. Bone Jt Surg 1956;38:922-929.*
2. Willis TA, Nutrient arteries of the vertebral bodies. *J. Bone Jt Surg 1949;31:538-540.*
3. Wagoner G, Pendergrass EP, Intrinsic circulation of the vertebral body. With roentgenologic considerations. *Amer J Roentgenol 193;27:818-826.*
4. Ferguson WR Some observations on the circulation in fetal and infant spines. J. Bone Jt Surg 1950; 32:640-648.
5. Wiley AM, Trueta J, The vascular anatomy of the spine and its relationship to pyogenic vertebral osteomyelitis. J. Bone Jt Surg 1959;41:796-809.
6. Guida G, Cigala F, Riccio V, The vascularization of the vertebral body in the human fetus at term. *Clin Orthop 1996;65:229-234.*
7. Crock HV, Yoshizawa H, Kame SK Observations on the venous drainage of the human vertebral body. J. Bone Jt Surg 1973;55:528-533.

8. Crock HV, Yoshizawa H The blood supply of the lumbar vertebral column. *Clin Orthop 1976;115:6-21.*
9. RatcliffeJF, The arterial anatomy of the adult human lumbar vertebral body: a microarteriographic study. *J Anat 1980;131:57-79.*
10. Ratcliffe JF, The arterial anatomy of the developing human dorsal and lumbar vertebral body. A microarteriographic study. *J Anat 1981;133:625-638.*
11. Ratcliffe JF, An evaluation of the intra-osseous arterial anastomoses in the human vertebral body at different ages. A microarteriographic study. *J Anat 1982;134:* 373-382.
12. Lametschwandtner A, Miodonski A, Simonsberger P, On the prevention of specimen charging in scanning electron microscopy of vascular corrosion casts by attaching conductive bridges. *J Mikroskop 1980;36:270-273.*
13. Lametschwandtner A, Lametschwandtner U, Weiger T, Scanning electron microscopy of vascular corrosion casts -technique and application: updated review. *Scan Microscopy 1990;4:889-941.*
14. Konerding MA, Blank M, The vascularization of the vertebral column of rats. *Scan Microscopy 1987;1:* 1727-1732.
15. Oki S, Matsuda Y, Itoh T, Shibata T, Okumura H, Desaki J,Scanning electron microscopic observations of the vascular structure of vertebral end-plates in rabbits. *J Orthop Res* 1994;12:447-449.
16. Skawina A, Litwin JA, Gorczyca J, Miodonski AJ, Blood vessels in epiphyseal cartilage of human fetal femoral bone: a scanning electron microscopic study of corrosion casts. *Anat Emb 199;189:457-462.*
17. Bareggi R, Grill V, Zweyer M, Narducci P, Forabosco A A quantitative study on the spatial and temporal ossification patterns of vertebral centra and neural arches and their relationship to the fetal age. *Ann Anat 1994;176:311-317.*
18. Hensinger RN, MacEwan C , Congenital anomalies of the spine. *Spine 1975;4:157-229.*

MOLECULAR DETECTION OF HBV AND HDV INFECTION AMONG HBsAg CARRIERS (MONGOLIA)

Azjargal B[1], Sarantuya G[2], Tsolmon S[1], Bira N[2], Batbaatar G[1]
[1]*School of Biomedicine, Health Sciences University of Mongolia*
[2] *School of Medicine, Health Sciences University of Mongolia*

ABSTRACT

Quantization of circulating hepatitis delta virus RNA is important for determining and monitoring the response to antiviral therapy and for understanding the complex dynamic interactions between hepatitis B virus and hepatitis D virus replication. There are scores of Polymerase Chain Reaction Assay studies on the quantitative molecular level of the hepatitis D Virus. The aim of this study was to evaluate via molecular detection the hepatitis D virus as a co-infection with hepatitis B virus in HBsAg carriers.

The study subjects consisted of 61 patients from the capital city of Mongolia who were infected with the hepatitis B virus. All of the 61 subjects were evaluated for the presence of HBsAg, anti-HBs, HBeAg, anti-HBe, anti-HBc, anti-HDV, anti-HCV, and the presence of HBV-DNA and HDV-RNA.

This study shows that 31.25% of HBsAg carriers had anti-HDV, and hepatitis B and D viruses with a viral load detected at a ratio of 2:4 in the study participants.

Key words: Hepatitis B virus, Hepatitis Delta Virus, Real Time Polymerase Chain Reaction

INTRODUCTION

Hepatitis Delta virus (HDV) infection is present globally and infects human beings already infected by Hepatitis B virus (HBV). It is estimated that 40% of the world's population has had contact with carriers of the hepatitis B virus. This corresponds to an estimated 350 million people who are HBV carriers/1/. It has been estimated that approximately 5% of HBV carriers are co-infected with HDV, leading to an estimated 15 million people infected with HDV worldwide /2/.

Hepatitis Delta is seen more frequently in Africa, South America, Romania, Russia, and the Mediterranean region including Southern Italy /1/. Around 15-20% of the population of Mongolia are carriers of HBV /3/. Among the HBsAg carriers, anti-HDV was detected in 92%, with genotype I predominant in Mongolia /3/. The dual infection of HBV and HDV occurs in the form of co-infection or as a super-infection. The super-infection of HDV with HBV causes a progressive, chronic liver disease in up to (80%) of those infected, which further exacerbates liver cirrhosis and hepatocellular carcinoma (HCC). Patients infected by both HBV and HDV viruses have an increased risk of a more severe, acute liver disease, and an increased risk for developing fulminate hepatitis when compared to patients infected with HBV only /4/. Nevertheless, information on quantitation of hepatitis Delta Virus RNA (HDV-RNA by RT-PCR) is scarce. The aim of this study was to evaluate via molecular detection the HDV as a co-infection with HBV in HBsAg carriers in Mongolia. We report qRT-PCR results of HDV-RNA among HBsAg carriers who are either negative or positive for anti-HDV in respect to their disease severity.

***Corresponding author:**
Azjargal Batjargal
Post graduate Institute
Chingeltei district, Juulchin street-38, Taiwan Culture center-208
Phone: 50119993, 99104441
Fax: 11-50119993
E-mail: azaa6539@yahoo.com

METHOD AND

Sample collection

This study was followed by principles outlined in the Helsinki Declaration, with an agreement for performing our research from the Ethical Committee of Bio Medicine. A total 61 subjects from the capitol city of Mongolia, who were previously checked for HBsAg by ELISA, were evaluated for the study done during 2009-2010 at the School of Health Technology. Forty seven of the subjects were enrolled in the study by the inclusion criteria because they were positive for HBsAg and negative for anti-HCV (Figure 1).

Evaluation of liver enzyme activity was to include the following:

Alanineaminotransferase(ALT),aspartateaminotransferase (AST), and gamma glutamyl transpeptidase (GGT) all evaluated by using standard methods of ELITech Inc (Germany).

Figure1. Disposition of subjects and main features of the study.

Cancer and viral markers by ELISA

Alpha fetoprotein (AFP) was evaluated by using the methodology described in the manufacturer's protocol of Eu Cardio Inc (USA).

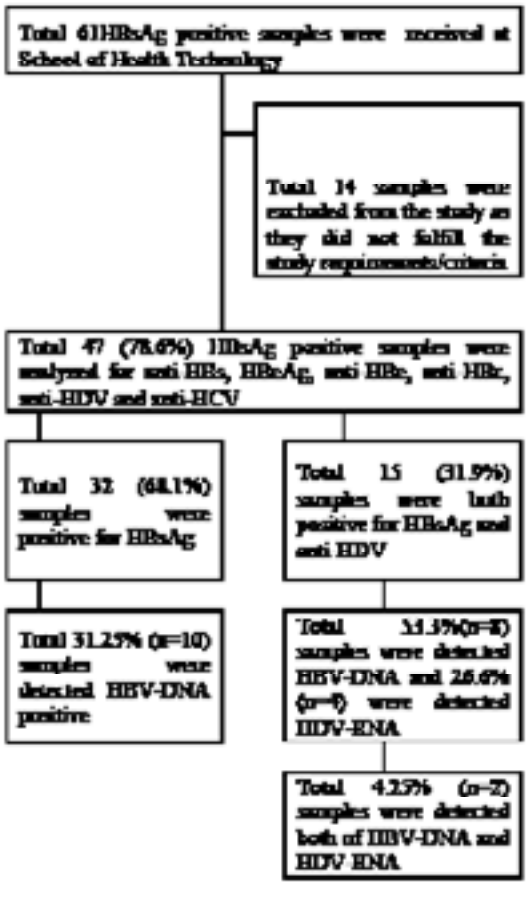
Initially all the serum was checked for HBsAg, anti-HBs, HBeAg, anti-HBe, anti-HBc, and anti-HCV index using DRG kits (Germany). Anti-HDV antibody was detected by using quantitative ELISA (RDG, China) kits using the methodology described in the manufacturer's protocol.

Quantitation of HBV-DNA and HDV-RNA by RT-PCR

HBV-DNA and HDV-RNA were extracted from 50 uL serum samples using Genesig (Primer Design, UK). DNA and RNA detection was done according to the manufacturer's protocol.

Quantitation of HBV-DNA and HDV-RNA was done by using Genesig kits (Primer Design, UK) and MX 3000 P (Applied by Stratagene Agilent Inc.,) and all the probes were thoroughly followed.

Figure1. Disposition of subjects and main features of the study



Statistical analysis

All of the data was analyzed by using SPSS 19.0 software and expressed as the mean ±SD. Statistical significant was assigned at the $p<0.05$ level. Independent T tests were used to compare differences of means between HBsAg positive groups with or without anti-HDV.

RESULT

A total of 22.9% (n=14) samples were excluded from the study since they fell within the exclusion criteria being negative for HBsAg or positive for anti-HCV. From those excluded samples, 9.83% (n=6) were positive for anti-HCV, 1.6% (n=1) was negative for any virus, and 1.6% (n=1) was negative for HBsAg, but positive for both of anti-HBc and anti-HDV. Out of the 47 enrolled patients, 53.19% (n=25) were females and 46.80% (n=22) were males. The mean age was 38 ± 12 years.

We divided the HBsAg positive patients into two groups based on the anti-HDV result. The HBsAg and anti-HDV positive subjects had higher levels of ALT and AST when compared with those who were negative for anti-HDV (Table 1).

Table1. Comparison of liver function test results and other characteristics between HBsAg positive subjects with or without hepatitis Delta virus (anti-HDV) infection

	Group 1 anti-HDV negative n=32	Group 2 anti-HDV positive n=15	T	p
ALT (IU/L)	48.59±29.35	71.27±43.54	-2.72	0.044*
AST(IU/L)	56.81±28.8	84.54±43.07	-2.57	0.01*
GGT(IU/L)	59.97±57.33	85.66±84.7	-1.2	0.23
AFP (ng/mL)	2.06±4.6	4.72±6.52	-1.13	0.264
PT &INR	1.12±0.38	0.96±0.41	1.36	0.18

Results are mean±StandardDevision

ALT- alanine aminotransferase; AST- aspartate aminotransferase; GGT- gamma glutamyltranspeptidase; AFP- alpha fetoperotein; PT&INR- Prothrombin Time and International Normalized Ratio; Upper limits range of ALT and AST is 45 international units per liter (IU/L) and 50 IU/L for GGT.

A total 31.25% (n=15) samples were positive for both anti-HDV and HBsAg, and 68.75% (n=32) samples were positive for HBsAg only. By the quantitative RT-PCR results, 31.25% (n=10) of the samples were positive for HBV-DNA in the first group; and 53.3% (n=8) of the samples were positive for HBV-DNA and 26.6% (n=4) of the samples were positive for HDV-RNA in the second group.

DISCUSSION

One of the interesting findings of the current study is that 31.25% (n=15) were seropositive for both HBsAg and anti-HDV, with molecular detection at a ratio of 2:4. There is a decreasing prevalence of both acute and chronic HDV infections in the Mediterranean area and in many other parts of the world, which has been attributed to a decline in the prevalence of chronic HBsAg carriers in the general population /5/. Although epidemiologic studies on HDV infection are scarce, the rate of people who were seropositive for anti-HDV and HDV found in this study was lower in comparison to an earlier study done in 1988 among the same population /6/. In addition, among the HBsAg carriers, anti-HDV was detected in 92%, and HDV-RNA was detected in 83.3%/4/. Our results maybe differ from other researchers results since we had a comparably fewer number of participants.

In our study there was one subject who was positive for both anti-HDV and anti-HBc, but negative for HBsAg. This subject was also negative for the HDV-RNA. It indicates a past infection with HBV and HDV. This result is similar to Davaalkham's study /7/.

In summary, 31.25% (n=15) of HBsAg carriers were seropositive for anti-HDV. HBV-DNA was detected in 38.2% (n=18) of the samples, and HDV-RNA was detected in 8.51% (n=4) of the samples. Viral load for HBV and HDV was detected at a 2:4 ratio. Given the high prevalence of HDV infection, and the high rates of chronic liver disease associated with viral hepatitis in our population, further studies are urgently needed to find ways to help prevent the spread of viral hepatitis in Mongolia.

ACKNOWLEDGEMENTS

We thank the study participants, field staffs, school teachers of the School of Health Technology and the School of Biomedicine of Health Sciences University of Mongolia, and Stand laboratory.

REFERENCES

1. World Health Organization Hepatitis Delta. [http://www.searo.who.int/EN/Section10/Section1027_9489.htm], [WHO/CDS/CSR/NCS/2001.1].
2. Farci P,Delta hepatitis: an update. J Hepatol2003, 39(Suppl 1), S212-S219.
3. Takahashi M, Nishizawa T, Gotanda Y, Tsuda F, Komatsu F, Kawabata T, Hasegawa K, Altankhuu M, Chimedren U, Narantuya L, Hoshino H, Hino K, Kagawa Y, Okamoto H, Highprevalence of antibodies to hepatitis A and E viruses and viremia of hepatitis B, C and D viruses among apparently healthy populations in Mongolia. 2004, *ClinDiagn Lab Immunol 11:392-398.*
4. Yamaguchi Y, Handa H: HIV and hepatitis delta virus:evolution takes different paths to relieve blocks in transcriptionalelongation. 2002, Microb Infect, 4:1169-1175.
5. Aragona M, Macagno S, Caredda F, et al. Serological response to thehepatitis delta virus in hepatitis D. Lancet. 1987, 1:478–82.
6. Nymdavaa P, Anan'ev VA, OyunbilegZh, ChernovetskiiMA.Thefreaquency of detecting antibodies to delta antigen in virtually healthy HBsAg and anti-HBs carriers in Ulaanbaator.1988, VoprVirusol 33: 246-247.
7. Davaalkham D, Ojima T, Watanabe M, Oki I, Nymadawa P, Takahashi M, Okamoto H, Nakamura Y. Hepatitis Delta Virus infection in Mongolia: Analyses of geographic distribution, risk factors, and disease severity. 2006,*Am J.Trop.Med.Hyg., 75 (2), 365-369.*

A STUDY OF THE VASCULARIZATION OF THE HUMAN LIVER CAPSULE IN SUBJECTS AGED 0-18 YEARS

Purevsuren Kh [1], Enebish S[2],Badamjav S[2], Dagdanbazar B[2], Amgalanbaatar D[2]
[1,2] *Department of Anatomy, School of Biomedicine*
Health Sciences University of Mongolia

ABSTRACT

We studied 120 capsules from 90 cadavers, both male and female, aged 0-18 years who died from causes unrelated to the liver. When conducting the research, we instilled a water soluble agent of black ink at a 1:3 ratio through the abdominal artery of the cadavers aged 0-3 years, then peeled off the capsule and placed the catheter in the liver artery by the method described by V.P.Vorobiev (1925), D.Amgalanbaatar (1984), and B.Dagdanbazar (1992). We then prepared a slide and microscopically studied the microcirculation of arteries I, II ,and III of the liver capsule. With larger children's cadavers, we disected the liver, placed a catheter into the artery, and instilled the solution. We took micro photos from slide preparations and examined the pattern of the blood vessel branching of the liver capsules of our Mongolian cadaver subjects to determine the general regularity of the microcirculation and the order of blood vessel branching.

We learned from our study that the microcirculation of the liver capsule originates from the dexter and sinister branches of the superior and inferior phrenic arteries, dexter and sinister suprarenal artery, and dexter and sinister branches of the internal thoracic artery. When the diameter of the branching arteries in order I, II, and III of the capsule are decreased in diameter, they form double, triple, and tetra branches having a rectangular shape. Veins follow these arteries in a combined single or double form. Two venules are formed following one arteriole through the microcirculation of the liver capsule that become a module with a multi-angle circle. In its center arteriole, precapillary, capillary, and postcapillary vessels form the blood's in-and-outflow network.

Key words: Liver capsule, vascularization, microvessel network

INTRODUCTION

M.G.Prives (1985), and M.P.Sapin (1986) wrote general regularity, in our country P.Dolgor (1979), B.Goosh (1989), N.Davaatseren (1979), B.Munkhtogoo (1988) determined more in detail but there isn't any material on model of network of liver capsule. In the condition of our country B.Dagdanbazar (1980), B.Purevsuren, B.Ragchaa (1984) studied by observing. From foreign researchers G.B.Agarkov (1975) studied and determined liver capsule vessel. Researchers M.Tuul, L.Lkhagva, D.Sambupurev (1997) studied liver structure of Mongolian males and females aged 17-39, determined it's weight by age group and drew indices on liver weight but there isn't any research work of studying blood supply variant and these indices on people aged under 17 and over 40. When we looked for press material works on liver capsule vascularization and peculiarity of age and microcirculation network. But in the practice of organ transplantation liver vascularization and it's rehabilitation are still one of the interesting problems. These became the background of conducting research work in this direction.

Purpose

We aimed at studying and clearing up liver capsule vascularization and it's peculiarity of comparatively healthy Mongolians and put forward the following objectives it be solved.

Objective

1. To determine source of blood supply of liver capsule of Mongolians
2. To determine model and order of branching of liver capsule of Mongolians
3. To define regularity of microcirculation net of liver capsule of Mongolians.

***Corresponding author:**
Purevsuren Khaltar
Department of Anatomy
Sukhbaatar district-13,S. Zorig street-210648
Phone: +976-11-99193198, +976-11315281
E-mail: purevsuren_06@yahoo.com

Novelty

We determined that microcirculation network structure of liver capsule forms special network of microcirculation network in each part by studying liver capsule of the Mongolians in the condition of our country.

MATERIAL AND METHODS

1. Material of the study

We took 120 capsule from 90 children cadavers who died not cause liver aged 0-18 of males and females involved in our study.

2. The method of the study

When conducted the research we poured out 1:3 water soluble agents of black ink through the abdominal artery of the cadavers aged 0-3, peeled off the capsule, put catheter in liver artery by the method of V.P.Vorobiev (1925), D.Amgalanbaatar (1984), B.dagdanbazar (1992) prepared micro preparation and studied spreading of order branch of artery liver capsule, network of microcirculation and proportion by the microscopy (microstar 120). We compared, confirmed and studied the result of study by taking photo.

RESULT

Seeing from the result of our study liver capsule of Mongolians takes its blood supply through little artery which passed dexter and sinister branch of superior and inferior phrenical artery, dexter and sinister suprarenal artery and dexter and sinister branch of internal thoracic artery, its dexter and sinister triangular ligament, falciforme ligament. Form of these artery I,II,III order of branch, angiostructure, model of microcirculation and 2 surfaces of liver have their own specifity. Besides these in the process of study it was noticed that liver artery, some branch from interlobular which does between liver particle are included in forming artery network of liver capsule.

In particular we noticed that in the process of pouring out black ink and corrose solution through liver artery, pouring substance. Spreads through branches from capsule of visceral surface and phrenical surface. It was observed clearly that this spreading formed whole angio and module model on the dyed, peeled out, and strengthened preparation it forms special shape of microcirculation network in each part, double and single vein follows artery of III order it was observed in the level of arteriole and venal and nerve branch. Following these vessels were determined. (Figure 1)

Figure 1. Microvessels network of liver capsule surface of phrenic of male adult. Kuprianov's original silver cast method. Magnification 100X. 1.thin artery, 2.arteriole, 3.venule, 4.precapillary, 5.postcapillary, 6. capillary net.

It was seen that besides the arteries which enter through liver capsule artery and its ligaments various arches formed from the terminal branches of the liver artery form anastomose. Veins which follow arteries are double and single it forms anastomose of arteriole and venule in the level of microcirculation. It attracted our attention very much. (Figure 2)

Figure 2. Microvessels network of liver capsule surface of phrenic of women. Kuprianov's original silver cast method. Magnification 100X. 1. 1.thin artery, 2.thin vein, 3.arteriole, 4.venule, 5.precapillary, 6.postcapillary, 7.capillary net.

DISCUSSION

We determined that source of liver capsule vascularization is liver artery branch, dexter and sinister branch of superior and inferior phrenical artery, dexter and sinister suprarenal artery and dexter and sinister branch of internal thoracic artery. Our study suits to the study by G.B.Agarkov (1975), B.Purevsuren (1984), B.Ragchaa (1984). But we don't agree with the opinion (by A.V.Kraev (1964), A.V.Drozdov (1964), Kakhars (1975), B.Dagdanbazar that liver capsule vessel network begins from the liver parenchyma, its liver own artery ramifications, and the interlobular some artery.

For venule and venule blood stream which originated from microcirculation of the blood of liver capsule is worth studying in detail further.

CONCLUSION

1. liver capsule vascularization were consisted apart from of hepatic artery, dexter and sinister branch of superior and inferior phrenical artery, dexter and sinister suprarenal artery and dexter and sinister branch of internal thoracic artery cross over liver ligament.
2. According to microvessels network the liver capsule determined formation differently from either liver surface of phrenic and viscerial. It's the angiostructure which pours hepatic artery, portal vein through ligaments.

REFERENCES

1. Prives MG, Lysenkov NK, Bushkovich VI. Human Anatomy, Medicine, Moscow. 1985; 283-288
2. Dolgor P. Diagnosis and treatment of hepatic echinococcosis subdiaphragmatic sites. 14.00.27.-Diss. Ph.D. Ulaanbaatar. 1979; 271
3. Goosh B. The combined and complicated echinococcosis of the liver. 14.00.27. -Diss.PhD. prof, Ulaanbaatar. 1988; 286
4. Davaatseren N. Clinic for diagnosis and treatment of calcified echinococcosis man. -Abstract. Ph.D. Ulaanbaatar. 1986; 26
5. Мөнхтогоо.Б. Клиническая диагностика и лечения множественного эхинококкоза печени.-Дисс.канд.м.н-УБ.:1991.-126с
6. Mönkhtogoo B. Clinical diagnosis and treatment of multiple echinococcosis of the liver. -Diss.Ph,D. 1991; 126
7. Starzl T. et al. Analysis of liver transplantation. Hepatology. 1984; 4:47.
8. Haubrich WS, Glisson of Glisson's capsule of the liver. Gastroenterology. 2001; 120, 1362.
9. Osamu Ohtani. Three-dimensional organization of the collagen fibrillar framework of the Human and Rat livers Arch. Histol. Cytol. 1988; Vol 51 №5. 473-488
10. Chapman GB, Eagles DA. Ultrastructural features of Glisson's capsule and overlying mesothelium in rat, monkey ahd pike liver tissue and cell. 2007; 39. 343-351

RESEARCH FOR OPERATIONS TYPE, MORBIDITY AND MORTALITY OF JAUNDICE

Unursaikhan Ch[1*], Dulamsuren B[2*],Sergelen O[2]

[1] *"Etugen" Medical University of Mongolia,*

[2]*Heailt Sciences University of Mongolia*

ABSTRACT

Our research objective is the improvement of surgery result between some pathogenic factors of billiard and pathologic tract and type of biliary track disease, specific characteristics of the treatment, operation method, technique, and risks.

The research has been done by retrospective and descriptive methods in the history of disease of 541 patients who were under operation treatment at the Central Clinical Hospital in 2000-2001. We have studied operation treatment types, morbidity and mortality of jaundice.

In the survey 541 customers were involved; 56.6% are women and 43.4% men. 24,2% were women in the age of 50-59 years old and 24.7% were 60-69 years old men. In the age-group between 50 and 59 years jaundice shows high rates. It can be shown that there is a regional influence for the patients; 66.9% of patients from the Khangai region and 3.5% from the Gobi region have jaundice dominantly. 57.1% of customers had intoxication, 6.3% pancreatit, 2.4% lever deficit, and 2.4 renal deficits. Especially intoxication /P<0.001/, lever deficit /P<0.0001/, renal deficits /P<0.0001/, and pancreatit /P<0.05/ influenced the morbidity and mortality after operation.

Choosing the right zusleg directly influences the result of the operation. More symptoms became apparent among the participators in the survey: 65.8% yellow skin, 69,5% yellow eyes, and 64% have done Cohers incisions. After the operation 76.9% improve yellow (P<0.0001), 81.3% abdominal adhesion (P<0.005) , 54% bile tracts adhesion after operation (P<0.031), 85.2% acute hepatitis (P<0.029), 30.1 % pneumonia (P<0.039), 91.7 % PCES (P<0.0001), and set stitch (P<0.09).

Key words: Post-cholecystectomy symptoms, jaundice, common bile duct,

INTRODUCTION

The research has done by retrospective and descriptive methods in the history of disease of 541 patients who had an operation treatment at hospital in 2000-2001. During jaundice 24 operations are done thus 5.9% has been done reoperation and 3.1% have mortality. 24.2% were women in the age of 50-59 years old and 24.7% were 60-69 years old men. We have studied reasons, influences, operation types of jaundice and reasons of morbidity after operation. The following reasons influenced morbidity after operation. 57.1% of customers had toxication, 6.3% pancreatit, 2.4% lever deficit, and 2.4 renal deficits.

During the last ten years 1.28% of the population in Mongolia has had surgeries for the disease of biliary tract. 4.2% of all the operations in Mongolia are operations of the biliary tract and 1.7% of them are caused by jaundice. Recovery of jaundice is 42.14%, morbidity after operation is 31.41 and mortality is 26.43%.

During jaundice the surgeries particularly laparotomy and revision, abdominal drainage, release abdominal adhesion occupy 10-15%. The operation cholecystectomy and choledochojejunal anastomosis has been done in most cases.

The following complications appeared after cholecystectomy of patients who have jaundice: scission pancreatic cancer, cholangit, and stenos of anastmosis after operation. Joint symptoms after biliary operation are apparent mostly in patients with jaundice. As seen from this, for tsesni hudii avahwe are able to pay attention to the people who have jaundice.

After surgery the following complications appeared in the patients: after examination drainage of bile tract and stitching CBD the following complications are mostly apparent:

***Corresponding author:**
Chadraabal Unursaikhan
"Etugen" Medical University of Mongolia
Sukhbaatar district-8, Beejin street-29
Phone: 99822594:98267686
Fax: 11-319149
E-mail: onoroo_725@yahoo.com

Table 1

Kind of operation

Operation	n	%
Abdominal drainage	459	15.90%
Choledochotomy	430	14.90%
Release abdominal adhesion	416	14.40%
Cholecystectomy	395	13.70%
Choledochojejunal anastomosis	261	9.60%
Release bile tracts adhesion	150	5.20%
Drainage of bile tract	121	4.20%
Remove CBD stone	99	3.40%
Stitching CBD	71	2.50%
Searcher CBD along operation	15	0.50%
Whipple	13	0.40%
Hepatojejunal anastomos	7	0.20%
Hepato-enteranastmos	7	0.20%
Cholecystostomy tube plesement	4	0.10%
Roux-en-Y anastomosis	4	0.10%
Anastomos brauna	4	0.10%
Liver resection	2	0.10%
CBD resection	2	0.10%
Intraoperative cholangiography	2	0.10%
Abscesstomy	2	0.10%
Echinococcotomy	1	0.00%
Intraoperative ERCP	1	0.00%

Table 2

Post operations complication

Post operation complication	P-value
Scission pancreatic cancer	0.0001
Cholangit	0.0001
Stenos of anastmosis	0.0001
Pces	0.0001
Levers dificit	0.002
Hepatit	0.005
Pancreatit	0.012
Scleros of Biliary tract	0.014
Cirrhos	0.016
Liver cancer	0.027
Biliary tract necrosis	0.047

After surgery searcher in biliary tract during operation the …….occured dominanty.

DISCUSSION

As it can be seen from the survey for patients who have had jaundice operation treatment 56.6% were women of which 24.2% are 50-59 aged women, and 24.7% 60-69 aged men. This result is very similar to the findings of international researchers that mostly women have biliary tract disease. There is a necessity to study the reasons of the few cases of jaundice in the Gobi region compared to the higher numbers in the western and central regions of Mongolia.

At the beginning stage of jaundice people have complications such as intoxication, yellow, pancreatit, lever deficit, or renel deficit which affects the results of operations. Therefore conservative treatment should be given before operations to decrease risky influences.

As it can be seen from our research, operation cut choices influenced positively the complications of jaundice operation treatment. Therefore it is very important to determine the reasons which are influencing jaundice and choose the operation cut correctly**.**

CONCLUSIONS

The morbidity of jaundice operation has increased. Jaundice depends on age, sex and region. During the

jaundice operation cholecystectomy, release abdominal and biliary tract adhesion have influenced the morbidity after operation. During jaundice PCES has become the reason of the morbidity after operation and reoperation.

REFERENCES

1. Batbold B & Amarsanaa E, Pathogenesis of gallbladder stone Journal of surgery Ulaanbaatar, Mongolia. 2005; 17-25
2. Batsaikhan N. Pack Kwan Tei, Sergelen O. & Bulgan CH Abdominal Laparoscopic surgery Journal of surgery Ulaanbaatar, Mongolia. 2005, 14-15
3. Oyuntsetseg B. Clinical manifestation of gallstone disease and some relation of stone characteristics. Dissertation Ulaanbaatar, Mongolia. 2007; 14-28
4. Akute OO, Obajimi MO. Cholelithiasis in Ibadan: an update. West Afr J Med. 2002; Apr-Jun;21(2):128-31
5. Cueto-Garcia, J, Jacobs, M & Michel Garner, M. Laparoscopic surgery 2005 ; 119,197, 210, 235
6. Lee FM, Chiang WK & Snten S. Cholelithiasis 2006; 36
7. Death and mortality statistics for Gall bladder condition 2006 from http://www.rightdiagnosis.com/g/gallblad/stats.htm
8. Prevention of Surgical Site Infections (SSIs) after Surgery 2010 from http://www.doctorwascher.com/tag/surgical-site-infection
9. Gallbladderhttp://www.cfnews13.com/content/news/cfnews13/news/article.html/content/news/articles/bn9/2012/5/14/priority_health_gall.html.

INSTRUCTIONS TO AUTHORS

THE MONGOLIAN JOURNAL OF HEALTH SCIENCES INSTRUCTIONS TO AUTHORS

The Mongolian Journal of Health Sciences publishes articles in basic and clinical health sciences. The Editorial Board welcomes contributions in the form of original research reports, review articles, brief communications, case reports, commentaries, clinical practice materials, and letters to the editor, medical memoranda. The Journal also publishes review of books and audiovisual materials, and other (medical) educational materials; socioeconomic, political and legal matters related to medical practice; conference and workshop reports and other categories including medical news.

Manuscripts (three copies of manuscripts, tables, figures, etc.) as well as books for review, notices of conferences, and news of importance, should be sent with a covering letter to The Assistant Editor, The Mongolian Journal of Health Sciences, Health Sciences University of Mongolia, Ulaanbaatar, Mongolia.

Manuscripts should be prepared in accordance with the **"Uniform Requirements for Manuscripts submitted to Biomedical Journals"** issued by the International Committee of Medical Journal Editors (http://www.icmje.org). Manuscripts are considered with the understanding that they have neither been published previously nor are under consideration by another publisher. Publication of preliminary findings elsewhere (in an abstract form) does not exclude consideration by MJHS.

All contributions, including those solicited, are subjected to peer review by editors of the Journal and/or invited assessors. The decision of the editors is final. Authors are responsible for all statements contained in their contributions.

CATEGORIES OF CONTRIBUTIONS

Original Articles

Original research works concerning any aspect of health sciences. Animal research contributions of relevance to human health are also welcome. Text should be 8-20 **double-spaced** (A4) manuscript pages (maximum 4,000 words).

Reviews including meta-analyses

Detailed, systematic and critical evaluation of the literature on a specified clinical problem. Reviews should include information such as type of studies and the selection process. Reviewed papers should have a maximum of 5,000 words or 15-20 double-spaced A4 manuscript pages and should contain subheadings.

Short Communications and Case Reports

These may be unique case reports, clinical experiences and short reports of original research. Text should not exceed 1,500 words or 3 to 10 double-spaced A4 pages including tables and legends, a maximum of 15 references, two illustrations and two tables. Format should be the same as for original contributions.

Workshop and Conference Reports

These may be general or specific conferences like medical grand rounds. Text should have a maximum of 5,000 words or 15-20 double-spaced A4 pages.

Medical Memoranda

These are papers expressing personal or group opinion on political, socioeconomic, and other matters as they relate to the practice of medicine. Text should be 8-15 double-spaced A4 manuscript pages.

Letters to the Editor

These are editorially dealt with and not subject to peer review. Letters should contain a maximum of 1,000 words, two illustrations/tables and ten references. Contents of letters may be comments on materials published in the Journal, clinical observations or other matters of relevance to medicine and allied professions. Submit an original and a copy typed with double-spacing.

MANUSCRIPT FORMAT AND PREPARATION

Authors should prepare manuscripts in accordance with these instructions.

Manuscripts should be typewritten in English with double spacing on one side only of 21.6 x 27.9cm (A4) white bond paper with 2.5cm margins. Manuscripts for papers should be divided into sections, with appropriate section headings. The organization should be as follows: **Title page, Abstract, Key Words, Introduction, Methods, Results, Discussion, Acknowledgments (if any), References, Tables, and Figure legends.**

Submit the original and two copies of the manuscript with three sets of glossy prints of figures. Number manuscript pages consecutively, beginning with the title page. Each manuscript component should begin on a new page in the sequence given above.

Title Page should include the title of the manuscript, initials and surname (last name) and qualifications of each author; names of departments and institutions in which the work was done or affiliated; name and address of corresponding author; three to six keywords for indexing; and a running title of not more than forty characters. Avoid use of abbreviations in the title.

Abstract: This should contain 150-250 words and be structured under the specified headings for original articles, short communication, case reports and reviews as follows: Original contributions: **(a) Introduction, (b) Materials and Methods (including design, setting, intervention and measurements); (c) Results (d) Conclusions.**
Reviews: (a) Purpose, (b) Data Sources, (c) Study Selection; (d) Data Extraction; (e) Results and (f) Conclusions.
An unstructured summary of 150 words or so should be provided for other types of articles. Editorials, letters, commentaries, medical memoranda and position papers need carry no summarises as specified herein.
Avoid use of abbreviations in the abstract.

Keywords: Provide three to six keywords (preferably using Index Medicus Medical Subject Headings) below the abstract.

Introduction. This section should contain a statement regarding the purpose or aim of the study, the rationale for the study, and a brief summary of previous relevant investigations. All of the background literature should not be included in this section.

Methods. Materials and procedures must be presented in sufficient detail so that the work can be repeated by other investigators. Methods previously published should not be described in detail; rather appropriate references should be cited. The sources of special reagents or instrumentation used in the study should be provided along with the location of the manufacturer.
Units of measurement should be those in international use (preferably SI units). Temperatures should be given in degrees Centigrade. Omit periods after units of measurement (e.g., cm, mg, ml, h, min, s, and 37 □), and do not use plurals.
Use % in the text, rather than per cent or percent.
All research involving either human subjects or materials of human origin should proceed in accordance with the principles embodied in the Declaration of Helsinki of 1975. For animal experiments, authors should follow the guidelines for the care and use of laboratory animals established by their institution. When the study involves recombinant DNA, experiments should be performed according to the guidelines issued by the authorized agency in the country where the research is performed. Avoid detailed mathematical explanations, which can be summarized in an Appendix.
The use of abbreviations is limited to those required to improve clarity and readability. Abbreviations will be allowed for only long and frequently repeated terms. Such abbreviations may be used after being defined in parentheses the first time they appear in the text. Abbreviations may be used in tables and figures if they are defined in the table titles or footnotes and in the figure legends.
Text should consist of introduction including a brief review of the literature; details of Research design, Subjects, Materials and Methods, Ethics, Statistics; Results and Discussion. Long articles should provide sub-headings.
Abbreviations and Nomenclature List in an alphabetical order non-standard abbreviations contained in the manuscript (excluding references) with definitions after the keywords. Use abbreviations sparingly and only when necessary to save space, and to avoid repeating long chemical names or therapeutic regimes. In a figure or table, define the abbreviations used in a footnote.
Use generic names for all drugs except where there is a good reason to use proprietary (trade) names such as drugs showing adverse effects, comparison of different preparations of the same agent, etc.

Ethical considerations: All manuscripts reporting experiments on human subjects should be accompanied by a statement in the methods section that the author/s have complied with the requirements of the Ethical Committee of the Institution in which the work was done. If investigators have no access to an ethics committee, the principles outlined in the Helsinki Declaration should be followed. Avoid using patients' names, initials, or hospital numbers. If full-face photographs are to be used, such photographs must be accompanied by a signed or thumb printed informed consent of the subject. Animal experimentation must also follow institution's guidelines and/or National Laws in the use of Laboratory animals in research.

Results. This section should contain a concise description of the data provided in the tables and figures, which should be easily comprehensible. Excessive explanations of the data presented in the tables and figures should be avoided.

Discussion. The results should be interpreted and related to existing knowledge in the field. Information already presented in the introduction or results sections should not be repeated.

Acknowledgments. Authors must declare all financial support for the research and conflicts of interest, including directorships, stock holdings, and contracts. The Journal of Epidemiology would not wish the authors to be embarrassed if any undisclosed conflicts of interest were to emerge after publication. Aid with technical issues, statistical analyses, photography, or stenography and advice from colleagues can be acknowledged.

References. The references should be consecutively numbered in the order that they are first mentioned in the text. Do not list references alphabetically. The references may contain only published studies and papers in press. Unpublished data, manuscripts submitted but not yet accepted, and personal communications are specifically excluded from the reference list. However, they may be

indicated within the text in parentheses as, for example, (Saito E., personal communication). Identify references in the text, tables, and legends by Arabic numerals in parentheses.

References should conform to the examples given below. For more details, the authors should consult to the Sample References page of International Committee of Medical Journal Editors Uniform Requirements for Manuscripts Submitted to Biomedical Journals (http://www.nlm.nih.gov/bsd/uniform_requirements.html)

1. Standard journal article
   Maellaro E, Dominici S, Del Bello B, Valentini MA, Pieri L, Perego P, Supino R, Zunino F, Lorenzini E, Paolicchi A, Comporti M, Pompella A. Membrane -glutamyl transpeptidase activity of melanoma cells: effects on cellular H_2O_2 production, cell surface protein thiol oxidation and NF-kB activation status. *J Cell Sci*. 2000;113:2671–2678.
2. Standard journal article in non-English
   Alimaa D, Nymadawa N. Pathogenic agents and epidemiologic features of acute and chronic hepatitis, primary liver cancer. Mongolian Medical Sciences 1995;2:23-28. (in Mongolian).
3. Book
   Murray PR, Rosenthal KS, Kobayashi GS, Pfaller MA. Medical microbiology. 4th ed. St. Louis: Mosby; 2002.
4. Book chapter
   Meltzer PS, Kallioniemi A, Trent JM. Chromosome alterations in human solid tumors. In: Vogelstein B, Kinzler KW, editors. The genetic basis of human cancer. New York McGraw-Hill; 2002. p. 93-113.
5. Homepage/ Website
   Cancer-Pain.org [homepage on the Internet]. New York: Association of Cancer Online Resources, Inc.; Available from: http://www.cancer-pain.org/ [Accessed on 16 May 2002].

Abbreviations of Journal names should conform to those provided in the Index Medicus (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=journals). List all authors when fewer than 6; when there are more than 6 authors, list the first 6 followed by et al. If the title of a paper is in a language other than English, French, or German, it should be translated into English, and the original language should be indicated in parentheses; for example, (in Japanese). Authors are responsible for the bibliographic accuracy of all references.

Every reference must be checked, both in the manuscript and in proof.

Tables. Tables should be typed on separate sheets, numbered using Arabic numerals, and have a brief title. For footnotes, use the following symbols, in this sequence: *, † , ‡ , § , □ , ¶ , **, †† , ‡‡

Do not use internal horizontal and vertical rules.

Illustrations. Photographs, charts, graphs, and diagrams are termed figures and should be numbered consecutively in Arabic numerals. Line drawings and graphs should be professionally drawn and lettered; freehand and typewritten lettering is unacceptable. Photomicrographs and other photographic images should be submitted individually as unmounted, original, black-and-white prints. If authors wish to have a group of photographs printed together in a single block (composite figure), 1 set of photographs may be mounted to show the preferred layout. Photographs must be sized to fit within 1 column width (8.5 cm) or if needed, across 2 columns (17 cm). The maximum plate area for composite figures is 17 x 23 cm. Inappropriately sized material will be cropped or reduced by the Editorial Office or by the publisher. The figure number should not be placed on the printed surface. Letters, symbols, and arrows applied to the surface of a photograph must be of professional quality and sufficiently large to allow easy recognition. All legends should appear together on a separate page(s). Legends should be brief and specific. Indicate the staining method and magnification for each photomicrograph. Use of scale markers in the image is recommended for electron micrographs.

Figures should be submitted as DOC, RTF, XLS, PPT, TIFF, EPS, PSD, JPG, BMP, GIF, and/or AI files. Photographs and other scanned images must have a resolution of at least 350 dpi (dots per inch). Images with words must have a resolution of at least 600 dpi.

Borrowed Material. The original author and source of borrowed illustrations and/or tables, as well as of verbatim quotations totaling 200 words or more must be fully identified. Written permission must be obtained from both the original author and the publisher. Letters granting such permission should be forwarded along with the manuscript

Publication Fees

Printing fees depend on color printing and number of pages. Reprints are supplied at rates based on the number of pages in the printed article and the number of reprints ordered. A reprint order form will be sent to the corresponding author along with the proofs. The order should be returned with the corrected proofs.

REVISED MANUSCRIPTS AND PROOFS

Revised Manuscripts: Two copies of revised manuscripts should be sent to the editor. Proofs may be sent to the corresponding author for corrections if only specifically requested. If sent, such proofs must be returned to the Editor within seven days of posting by the Editor.

COPYRIGHT

On acceptance, the copyright of the paper will be vested in the Journal and Publisher. All authors should sign the copyright form (reproduced in each issue of the Journal) and should accompany the manuscript on submission.