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CONTENTS

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Manuscript and correspondence regarding subscription and advertisement should be addressed to

Editor-in-chief
Jahurul Islam Medical Journal,
Jahurul Islam Medical College,
Bhagalpur, Bajitpur, Kishoregonj,
Bangladesh.

Address of correspondence

Editor-in-chief, Jahurul Islam Medical Journal, Jahurul Islam Medical College,
Bhagalpur, Bajitpur, Kishoregonj, Bangladesh
Email : jimedj92@gmail.com

Editorial

Malaria free Bangladesh by 2030

*** Prof. Paritosh Chandra Paul, Professor of Pharmacology, JIMC**

* *For Correspondence*

Malaria is a common and life-threatening disease in many tropical and subtropical areas. It is a parasitic infection transmitted by the female Anopheles mosquito, infecting humans by four plasmodium species (P vivax, P falciparum, P ovale and P malariae) and mostly caused by plasmodium falciparum. There is currently a risk of malaria transmission in 91 countries and territories around the world. Affecting 300 million people and responsible directly for about one million deaths annually[1]. Africa accounts for 90% of the mortality burden for malaria and Southeast Asia accounts for 9% of the burden[2].

Bangladesh is considered as one of the malaria endemic countries in South Asia. Transmission of malaria is mostly seasonal and concentrated in the border regions. Out of 64 districts 13 districts bordering east and northeast parts of Bangladesh facing Indian states of Assam, Tripura and Meghalaya and part of Myanmar belong to the high risk malaria zone. Bangladesh has made significant progress against malaria. In spite of that about 34 million people still at risk from the disease, Bangladesh have a long way to go until elimination [3].

New plan for malaria elimination by government[4]

To ensure that the country remains on track to eliminate malaria by the regionally adopted goal of 2030, the Bangladesh Government has developed a new National Strategic Plan 2017–2021. The revised strategy has been drafted to ensure alignment with the WHO Global technical strategy for malaria (2016–2030). This will also greatly contribute towards overall national development and the Sustainable Development Goals (SDGs).

As part of the new plan, Bangladesh aims to achieve a "malaria-free Bangladesh by 2030". To achieve this, the country sets a target of five related objectives, as follows.

- Reduce annual parasite incidence in the 13 endemic districts to less than 0.46 by 2021.
- Interrupt local transmission of malaria in 8 of the 13 endemic districts by 2021.
- Ensure that the remaining 51 districts are free from local malaria transmission by 2021.
- Prevent the re-establishment of malaria in districts where transmission has been interrupted.
- Prevent the emergence of strains of Plasmodium falciparum malaria that are resistant to artemisinin-based combination therapies (ACT) in the country.

Challenges:

1. Geographical inaccessibility.
2. Population movement.
3. Drug resistance in neighboring countries.
4. Preparedness and prevention of outbreaks.
5. Cross-border collaboration with neighbouring countries.
6. Emerging insecticide resistance.
7. Shortage of trained manpower in remote areas.
8. Linguistic barriers.
9. Influence of climate change on mosquito vector distribution.

Priorities:

1. Radically reduce malaria burden in the four most endemic districts.
2. Providing malaria services for higher risk groups.
3. Addressing malaria issues related to Rohingya refugee situation.
4. Strengthen the existing malaria surveillance system.
5. Ensuring zero case reporting for all facilities in 'non-endemic' districts.
6. Private sector engagement in malaria response.
7. Ensuring high-level political commitment to tackling malaria.
8. Capacity building of health work

To tackling ongoing issues all related personnel are working and fighting for malaria. If we are really want to eliminate malaria we have to put focus on those in the highest policy level and engaged with them to invest more, considering the elimination needs.

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Original Article

Frequency and Distribution of ABO and Rh Blood Groups Among the Kashmiri Students of Jahurul Islam Medical College, Bajitpur, Kishoregonj.

Ali MO[1]

*1. * Md. Omar Ali, Professor, Department of Physiology, Jahurul Islam Medical College, Kishoregonj, Bangladesh.*

** For correspondence*

Abstract

Introduction: *Among the blood group systems discovered, ABO & Rh system is the most important with respect to blood transfusion, hematopoietic stem cell transplantation & organ transplantation.*

Methods: This prospective observational study was conducted in the private hospital, Dhaka from February 2010 to December 2014. Sixty two patients of 40 years and above underwent a unilateral approach for lumbar spinal stenosis, were included in this study. Patients having Cauda Equina Syndrome or spinal instability were excluded from the study. All patients were followed up postoperatively.

Result: *Mean age of the patients was 52.16 ± 6.87 years within the range of 40-68 years. Maximum (43.5%) patients were in age group 50 – 59 years followed by 40.3% and 16.1% in age group 40-49 years and 60-68 years respectively. Males (77.4%) were predominant than female (22.6%) and male to female ratio was 3.4:1. Mean follow up was 4.15 ± 2.08 years, 53.2% patients were followed up ≤ 5.0 years and 46.8% patients were followed up >5.0 years. In our study, 88.7% patients had no complication. Only 11.3% patients were found to have complications, of which 1.6% had CSF leak, 1.6% had discitis and, 8.1% had no improvement at all.*

Conclusion: *Unilateral approach showed good outcomes in patients with Lumbar spinal stenosis. Postoperative complication rate was infrequent and the success rate was satisfactory.*

Key words: *Blood groups, ABO, Rhesus factor and Kashmiri students.*

Introduction

The first blood group antigen was recognized in 1900 by the Austrian scientist Karl Landsteiner, who found three different blood types, namely A, B and O; for which he was awarded the Nobel Prize in 1930[1]. In 1902, Alfred von Decastello and Adriano Sturli discovered the fourth blood type, AB[2]. After forty years both Landsteiner and Weiner discovered Rh (D) antigen. The red blood cell membranes have the important and best known A and B antigens. They are also found in saliva, pancreas, kidneys, liver, lungs, testes and amniotic fluid[3]. The antibodies against red blood cell antigens are called agglutinins and individuals are divided into four major blood groups A, B, AB & O, according the presence of these antigens and agglutinins[4]. Type A has the A antigen and β agglutinin, type B has B antigen and α agglutinin, type AB has both antigens and no agglutinin, and type O has neither antigen and both agglutinins[5]. Type A and B antigens are actually complex oligosaccharides that differ in their terminal sugar.

On red cells there are mostly glycosphingolipids, whereas in other tissues there are glycoproteins[4,5]. The genes of ABO and Rh (D) are located on chromosome 9 and 1 respectively[6]. All human populations share the same blood group systems; although they differ in the frequencies of specific types. The incidence of ABO and Rh groups varies markedly in different races, ethnic groups, and socio-economic groups in different part of the world[5]. The knowledge of distribution of ABO and Rh blood groups at local and regional levels are helpful in the effective management of blood banks and safe blood transfusion services. Identification of Rh system is important to prevent erythroblastosis fetalis; which commonly arises when an Rh negative mother carries an Rh positive fetus[7]. The association of different blood groups with the diseases is important as some of the blood groups are particularly prone to developing certain diseases[8]. The present

study was done to assess the prevalence of blood groups in Kashmiri populations and to compare our results with other studies conducted in India and elsewhere in the world and its multipurpose future utilities for the health planners.

Materials and Methods

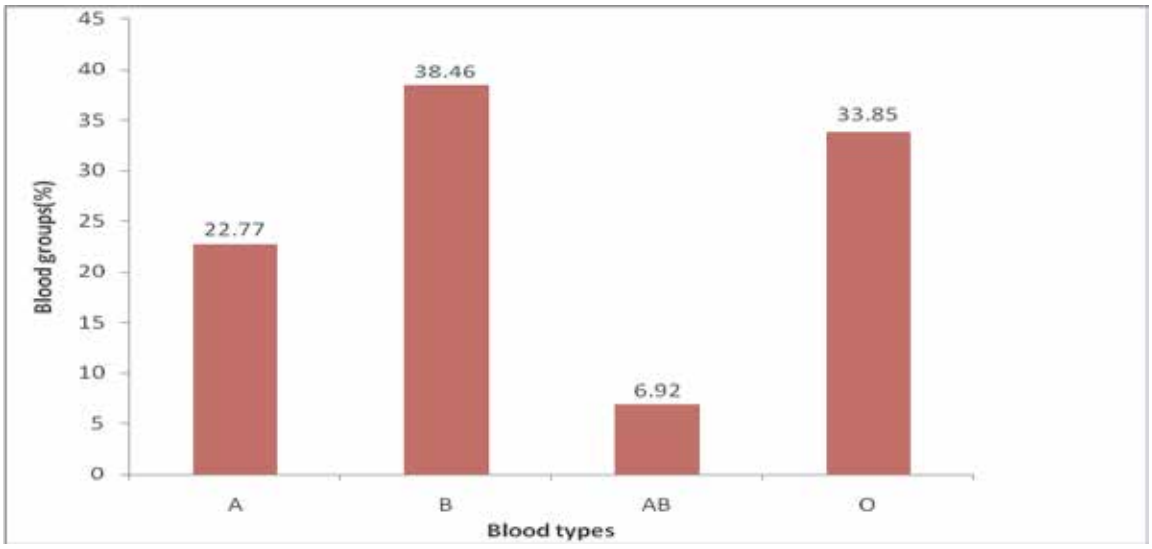
This observational cross sectional study was conducted in the Department of Physiology, Jahurul Islsm Medical College, Bajitpur, Bangladesh, during the period of 1st March 2012 to 29th February 2017. Study populations were Kashmiri students of JIMC. A total sample of 130 students were included in the study. All the participants were explained about the aims and objectives of the study and the blood grouping procedures were briefed to them. Consent was taken from the participants. Particulars of the each participant were taken in a data collection sheet. Three clean glass slides were taken and marked as A, B and D. After aseptic washing with 70% ethyl alcohol, blood samples were collected on grease free clean slides from left ring finger tip with the help of a sterile lancet. Blood groups were determined in a single slide to minimize any errors.

Determination of ABO and Rh (D) blood group was done by slide method. For grouping, commercial monoclonal antisera anti-A, anti-B, and anti-D were used. One drop of blood from each volunteer was placed on respective slides. Then it was diluted with one drop of normal saline. One drop of each of the antisera was added and mixed with the aid of glass rods. Then, the mixture was rocked gently for 60 seconds and observed for agglutination with naked eye and if any confusion arose then it was observed under microscope. The results of agglutination were recorded immediately after mixing. The agglutination in slide A was considered as group A, and agglutination in slide B as group B. The agglutination in both A and B slides was considered as group AB, and if no agglutination occurred in both slides, it was considered as group O. The agglutination in slide D was considered as Rh positive and no agglutination as Rh negative.

Result

Among the Kashmiri students of JIMC blood group B was predominant followed by O, A and AB. The frequency of A, B, AB and O blood groups in the students were 22.77%, 38.46%, 6.92% and 33.85% respectively. The results of ABO blood groups are shown in the Figure.

Figure: ABO blood groups among the Kashmiri students



Among the Kashmiri students only 8.46% was Rh negative and rest 91.54% was Rh positive blood. Distribution of Rh factor among the Kashmiri medical students are shown in the table.

Table: Distribution of Rh factor among the students

Groups	Number	Percentage
Rh (+)	119	91.54%
Rh (-)	11	8..46%
Total	130	100%

(+) = positive, (-) = negative

Discussion

Research on ABO blood group system has been of immense interest, due to its medical importance in different diseases. The ABO blood group system is not only important in blood transfusions, cardiovascular diseases, organ transplantation, erythroblastosis in neonates, but also one of the strongest predictors of national suicide rate and a genetic marker of obesity [9,10]**.** The genetic history of a person can be known by studying the blood groups[11]. Traditional slide method was used to determine blood group of the participants which was also used in other studies[12,13]. It has been observed that percentage of blood group distribution in different parts of the world is different depending upon the ethnic origin of the races[14]. In this study, among the Kashmiri medical students of JIMC, blood group B was the commonest blood groups. Some researchers also found almost similar findings. They showed that group B to be the most prevalent followed by group O, A, and AB[15,16]. Our previous study among the Bangladeshi medical students of JIMC also showed similar findings. Pathan et. al. and Sultana et. al. also found similar findings[17,18]. But other studies in different parts of India showed group O is the most common followed by B, A and AB[19-21]. Studies in Pakistan also explored that B blood group predominated in many regions of Swat and Multan[22], while in Sindh and in Baluchistan, group O was predominant[23]. Different studies in the Indo-Pak sub-continent revealed that there was an equal dominance of group B and O[24] Study in neighboring country Nepal showed different picture of higher frequency of group A[25]. In Britain and USA, group O and A were the commonest followed by B and AB[26,27].The prevalence of Rh (D) positive remains very high compared to the Rh (D) negative blood throughout the world. The current study also follow the global trend of much higher Rh (D) positive than Rh (D) negative. . Rhesus negative frequency in our study is comparable to that of North Indian populations[16]. Some studies among the Bangladeshi populations found the high frequency of rhesus positive blood that was similar to the current study[14,15]. But in a study in USA higher frequency of Rh (D) negative was found as 17% [28]. Frequencies of Rh (D) positive among the Caucasians, Blacks and Asian were 85%, 92% and 99% respectively[29]**.**

Conclusion

The present study concludes that blood group 'B' is the commonest blood group among the Kashmiri medical students followed by O, A and AB with Rh negativity of only 3.23% and the rest is Rh (D) positive which is in favor of findings found by many investigators within the country.

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Original Article

Sources and Knowledge of Third Hand Smoke

Asgar N[1], Kabir MH[2], Rashid MA[3], Hassan MA[4]

*1. * Dr Nilufar Asgar, Assistant Professor, Department of Community Medicine, Jahurul Islam Medical College*

2. Dr Md Humayun Kabir, Assistant Professor, Department of Community Medicine, Jahurul Islam Medical College

3. Dr Md Abdur Rashid, Chief Executive Officer and Senior Consultant of Ibrahim Cardiac Hospital and Research Institute

4. Dr Md Amirul Hassan, Associate Professor and Head of the Department of Public Health and Hospital Administration Biostatistics, NIPSOM

** For Correspondence*

Abstract

Background: *Coco Ballantyne stated that "Third-hand smoke is tobacco smoke contamination that remains after the cigarette has been extinguished," says Jonathan Winickoff. According to his study, a large number of people, particularly smokers, have no idea that Third-Hand Smoke the cocktail of toxins that linger in carpets, sofas, clothes and other materials hours or even days after a cigarette is put out—is a health hazard for infants and children.Particulate matter released from Third-Hand Smoke has been proven toxic[1]. According to the United StatesNational Toxicology Program, these 250 poisonous gases, chemicals, and metals include hydrogen cyanide, carbon monoxide, butane, ammonia, toluene (found in paint thinners), arsenic, lead, chromium (used to make steel), cadmium (used to make batteries), and polonium-210 (highly radioactive carcinogen).1Coco also stated that, eleven of the compounds are classified as Group 1 carcinogens, the most dangerous.Children ingest twice the amount of dust that grown-ups do. If a grown-up weighs 150 pounds [68 kilograms] and if a baby weighs 15 pounds [seven kilograms]. The infant ingests twice the dust [due to faster respiration and proximity to dusty surfaces]. Effectively, they'll get 20 times the exposure.Studies in rats suggest that tobacco toxin exposure is the leading cause of sudden infant death syndrome (SIDS). We think it is [caused by] respiratory suppression[1].*

Methods:*Total allocated study period was 6 months commencing from January to June 2010. Different places in Dhaka were selected purposely like as the Bus Terminal, Cinema Hall etc. Data was collected daily over a period of 10 days with the help of a pre-testedquestionnaire. Face to face interview of the respondents was done and after that collected data were processed and analyzed using software SPSS (Statistical Package for Social Sciences). The results were calculated, tabulated and analyzed with the help of a scientific calculator and also by computer.*

Result: *Mean age was 31.6 ± 10.7 of the 180 healthy adult respondents (≥ 18 years old) and male to female ratio was roughly 1:1. Over 20% of the respondents were smokers. 91.1% respondents expressed smoking as harmful for people surrounding smoker and 23.9% mentioned its harm even after the cigarette is extinguished. About 37% felt discomfort due to smell emitted from smoking particularly at home, 82.2% while walking on a busy congested road, 62.8% in waiting rooms, 60.6% in motor vehicles, 26.7% at office, 46.1% at shop, another 46.1% in public toilets, 66.1% at hotel, 23.9% in cinema halls and 17.8% in elevators. Regarding the issue whether smoking remnants could linger in the environmental objects, 27.8% strongly agreed and over 40% respondents opined that it may harm people. Approximately 37% of the respondents held the view that smoking remnants could induce allergy followed by 18.3% lung infection, 16.15% heart diseases, 11.7% ear infection and 11.7% asthma.*

Conclusion: *Although third-hand smoking is a new concept in the field of public health, people by their experience possessed a good level of knowledge about the harmful effects of third-hand smoking.*

Key words: *Effects of smoking, Second-Hand smoking, Sources of Third-Hand Smoke with factors and diseases related to it.*

Introduction

Winickoff JP stated,there is no safe level of exposure to tobacco smoke.Third-hand smoke is residual tobacco smoke contamination thatremains after the cigarette is extinguished. Children are equallysusceptible to third-hand smoke exposure as the adults are.[2]According to Johansson, the majority of adults are aware that visible SHS is harmful to health, and some smokers take measures to protect nonsmokers from this widely recognized harm[3]. According to Singer BC, These measures of highly variable efficacy include opening windows, smoking in other rooms, turning on fans, or simply waiting until the smoke dissipates to mitigate the harmful effects of their smoking on others. Research has documented the association between smoking in the home and persistently high levels of tobacco toxins well beyond the period of active smoking[4]. Matt GE stated, these toxins take the form of particulate matter deposited in a layer onto every surface within the home; in loose household dust; and as volatile toxic compounds that “off gas” into the air over days, weeks and months[5]. Smoking indoors on 1 day thus exposes people to tobacco toxins within that space in the future. We use the new term “third hand” smoke to name this complex phenomenon and define it as residual tobacco smoke contamination that remains after the cigarette is extinguished. This study is the first to examine the third hand smoke concept and home smoking bans.

According to Muggli ME, the toxicity of low levels of tobacco smoke constituents has been proved. According to the National Toxicology Program, these 250 poisonous gases, chemicals, and metals include hydrogen cyanide (used in chemical weapons), carbon monoxide (found in car exhaust), butane (used in lighter fluid), ammonia (used in household cleaners), toluene (found in paint thinners), arsenic (used in pesticides), lead (formerly found in paint), chromium (used to make steel), cadmium (used to make batteries), and polonium-210 (highly radioactive carcinogen).

Eleven of these compounds are group 1 carcinogens (most carcinogenic designation). For some of these compounds, such as radioactive polonium-210, the cumulative dose is especially concerning, leading health professionals to call for immediate disclosure and warnings about exposure[6].

Khurshid N says,Third-hand smoke refers to the tobacco toxins that build up over time; one cigarette will coat the surface of a certain room [a second cigarette will add another coat, and so on]. The third-hand smoke is the stuff that remains [after visible or "second-hand smoke" has dissipated from the air]5Smoking near a window or chimney, or turning on a fan or air purifier does not eliminate other people’s exposure to second-hand smoke. The smoke gets trapped in hair, skin, clothing, walls, carpet, furniture, toys etc. This is known as Third-Hand Smoke. The harmful chemicals will linger in fabrics or on surfaces long after the tobacco has stopped burning[7].

Risks in both adults and children

- Sudden infant death syndrome (SIDS). In his 2006 report, the US Surgeon General concludes: "The evidence is sufficient to infer a causal relationship between exposure to second-hand smoke and sudden infant death syndrome."
- Asthma
- Lung infections
- More severe illness with bronchiolitis, and worse outcome
- Increased risk of developing tuberculosis if exposed to a carrier
- Allergies
- Crohn's disease.
- Learning difficulties, developmental delays, and neurobehavioral effects. Animal models suggest a role for nicotine and carbon monoxide in neuro-cognitive problems
- An increase in tooth decay (as well as related salivary biomarkers) has been associated with passive smoking in children.
- Increased risk of middle ear infections

Methods And Materials

Study period: Total allocated study period was 6 months commencing from January to June 2010. Selection of the research topic of the study and the area of study was started in January 2010. A time schedule was prepared at the beginning of the study keeping in mind the different tasks that had to be completed within the time frame. Review literature was done for the first two months. Research protocol development and topic approval was also done during this period.Place of study: Considering the availability of the respondents, different places in Dhaka were selected purposely as the site of data collection as being the sources of Third-Hand Smoke like as the Bus Terminal, Cinema Hall, offices, Shops or even Car Parking Lots and residences. Study population: Healthy adults having present address at Dhaka were selected for the study. Preset questionnaire were taken to the respondents.

Eligibility criteria

(i) Inclusion criteria- all exposed population to Third-Hand Smoke

(ii) Exclusion criteria- respondents below 18 years were excluded due to ethical issues

Sample size: By using the formula for sample size determination that is $n= Z^2pq/d^2=178$(where Z=1.96, p=0.65, q=0.35 and d=0.07) , that is about 180 healthy adults (both male and female) age between 18 to 80 years, were taken as the study samples There were four categories of samples. Some of them were male smokers, some were male quitters and some were both male and female non-smokers.

Sampling technique: The samples were detected by a randomized sampling technique and data was collected daily over a period of 10 days.

Data collection instrument : Semi-structured written questionnaire Selection and development of the Research instruments: Keeping in mind of the objectives of the study a draft questionnaire was prepared. Then the questionnaire was pre-tested in non-sampling area and revised on the basis of feasibility and applicability.The first part of the questionnaire was for the socio-demographic information containing name, age, gender, educational level and occupation. The second part of the questionnaire included smoking history, smoking and non-smoking zones, knowledge about smoking related health effects and second-hand smoking. And lastly the third part contained the questions quite a bit about Third-Hand Smoke.Some information's were collected through face to face interview and some were taken by the respondents filling the forms by themselves.

Data collection procedure: After getting approval from NIPSOM and permission from the authority the researcher thy-self collected the data. Face to face interview of the respondents was done after taking verbal as well as written consent from the respondents. Data collection plan working schedule: Data collection was started on 23rd of April'10 from the Mohakhali Inter-districtBus terminal at 10:30 am and closed on 1st of May'10 at 7:30 pm at residence.

Data analysis plan: Collected data were processed and analyzed using software SPSS (Statistical Package for Social Sciences) for Windows version 11.5. The results were calculated, tabulated and analyzed with the help of a scientific calculator and also by computer. Frequency Tables and Figures were presented accordingly.Ethical issues: The respondents taken as sample of the study were informed thoroughly about the significance, process, limitations and even the consequence of this study. But it should be mentioned that they had the full right to withdraw or even discontinue the answering session anytime. And after the briefing they agreed to contribute and signed the consent form attached with the questionnaire or even gave verbal consent with fingerprint on the signing space.

Results

Smoking related variables:Over 20% of the respondents were smokers. Of them, 21.6% had been smoking for less than 5 years, 18.9% 5 – 10 years and rest 59.5% 10 years or more than 10 years. About 60% of smoker smoked 10 sticks or less than 10 sticks a day, 35.1% between 11 – 20 sticks and 5.4% more than 20 sticks a day. Asked how many of their family members were used to smoking, nearly 90% told that 1 – 2 members 8.4% 3 -4 members and 2.8%.5 – 6 members (Table I).

Table I . Distribution of respondents by smoking related variables (n = 180)

S MOKING RELATED VARIA BLES	*Frequen cy*	*Percentage*
Smoker	37	20.6%
Duration of smoking in years (n = 37)		
<5	08	21.6%
5 – 10	07	18.9%
≥10	22	59.5%
No. of sticks used per day (n = 37)		
≤10	22	59.5%
11 – 20	13	35.1%
>20	02	5.4%
No. of family member smoked		
1 – 2	63	89.8%
3 – 4	06	8.4%
5 – 6	02	2.8%

Smoking zone in the households:
Fifty four (30%) of 180 respondents informed that they smoked everywhere in the households and 16.1% told that they smoked in some specific areas (Table II).

Table II. Smoking zones in households of the respondents (n = 180)

SMOKING ZONE IN HOUSEHOLD	*Frequency*	*Percentage*
Everywhere		
Yes	54	30.0%
No	126	70.0%
In a specific areas		
Yes	29	16.1%
No	151	83.9%

Adverse effects of smoking:

In response to a question, whether they knew the adverse effects of smoking, majority (98.9%) told lung cancer, 90% heart disease, 55.9% brain disease, 39.4% kidney disease, 19.4% pancreas disease, 77.8 % diseases of the oral cavity, 92.8% cancer and 87.2% death (Table III).

Table III . Distribution of opined respondents by adverse effect of smoking (n = 180)

ADVERSE EFFECT OF SMOKING	*Frequency*	*Percentage*
Lung cancer	176	98.9%
Heart disease	162	90.0%
Brain disease	100	55.9%
Kidney disease	71	39.4%
Pancreas disease	35	19.4%
Oral cavity disease	140	77.8%
Cancer	167	92.8%
Death	157	87.2%

 # Total will not correspond to 100% because of multiple responses.

Knowledge about 3rd hand smoking:

Asked about the knowledge of the respondents about third -hand smoking, majority (91.1%) of respondents answered it harmed people around the smoker and 23.9% told it harmed even after the cigarette is extinguished (yesterday's smoking can harm today).(Table IV).

Table IV. Knowledge of the respondents about 3rd hand smoking (n = 180)

KNOWLEDGE ABOUT THIRD HAND SMOKING	*Frequency*	*Percentage*
Harm people around the smoker	164	91.1%
Yesterday smoking harm today	43	23.9%

Areas of the environment in which the respondents felt most discomfort due to smell emitted from smoking:

Asked about in which areas of the environment the respondents felt most discomfort due to smell emitted from smoking, about 37% said that they got it at home, 82.2% while walking on a busy congested road, 62.8% in waiting room, 60.6% in motor vehicles, 26.7% at office, 46.1% at shop, another 46.1% in public toilet, 66.1% at hotel, 23.9% in cinema halls and 17.8% in elevators. (Table V)

Table V. Areas of the environment in which the respondents felt most discomfort due to smell emitted from smoking (n = 180)

SMELL OF CIGARETTE SMOKE AT HOME	*Frequency*	*Percentage*
Home	66	36.7%
Road	148	82.2%
Waiting room	113	62.8%
Vehicle	109	60.6%
Office	48	26.7%
Shop	83	46.1%
Public toilet	83	46.1%
Hotel	119	66.1%
Cinema	43	23.9%
Elevator	32	17.8%

 # Total will not correspond to 100% because of multiple responses.

Nature of difficulties felt by the respondents due to smell smoking:

About two -third (65.6%) of the respondents said they feel discomfort due to smell, 58.3% to take breath, 28.9% nausea, another 28.9% dizziness, 21.7% burning eye and 9.4% others difficulties due to smell of cigarette smoke (Table VI).

Table VI . Nature of difficulties felt by the respondents due to smell smoking (n = 180)

TYPE OF DIFFICULTIES DUE TO SMELL	*Frequency*	*Percentage*
Discomfort	118	65.6%
Breath difficulty	105	58.3%
Nausea	52	28.9%
Dizziness	52	28.9%
Burning eye	39	21.7%
Others	17	9.4%

 # Total will not correspond to 100% because of multiple responses.

Smoking remnants can harm people:

Figure1 demonstrates the harmful effect smoking remnants on people around the smoking zone. Over 41% of the respondents opined that remnants of smoking could harm people around the smoking zone. [Figure.I]

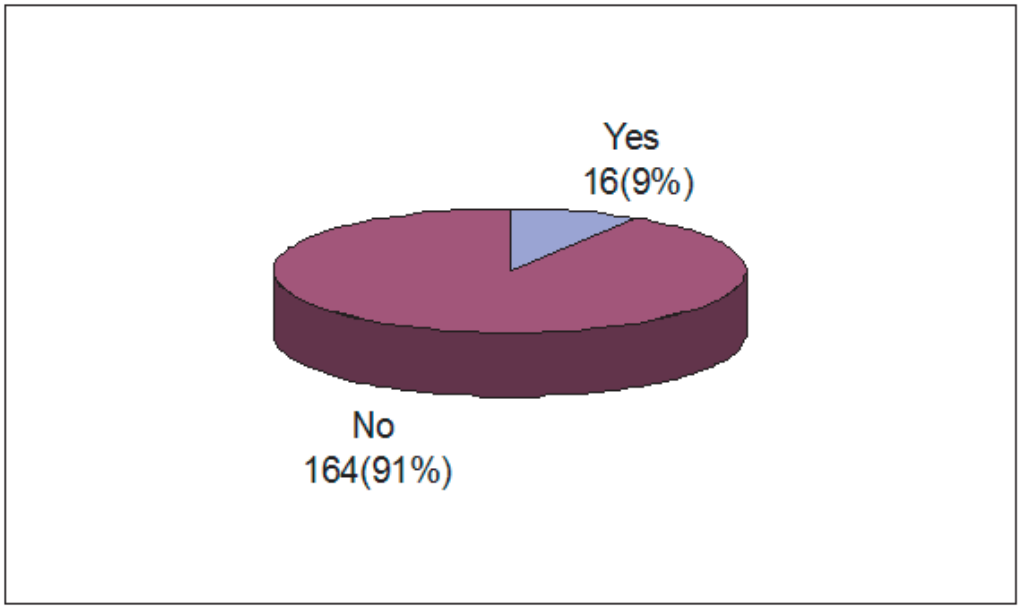

Figure I: Respondents' view about harmful effect of smoking remnants

Support smoking anymore:

As respondents were asked whether they would support smoking anymore, majority (91%) told no more [Figure.II]

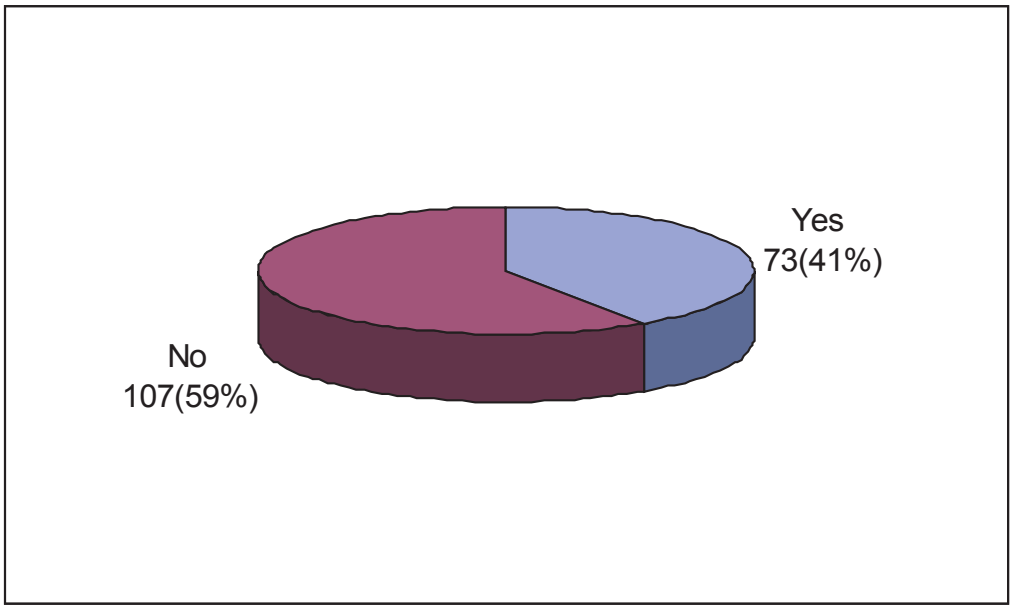

Figure II: Respondents' view about support of smoking

Level of knowledge:

The respondents' level of knowledge was subdivided into five categories, such as, unaware, poor, moderate, satisfactory knowledge and highly satisfactory as described in the methodology section. Accordingly, about one -quarter (24.4%) of the respondents was unaware of the third -hand smoking, 33.3% had poor level of knowledge, 27.8% moderate, 13.9% satisfactory and only 0.6% highly satisfactory knowledge [**Figure. III]**

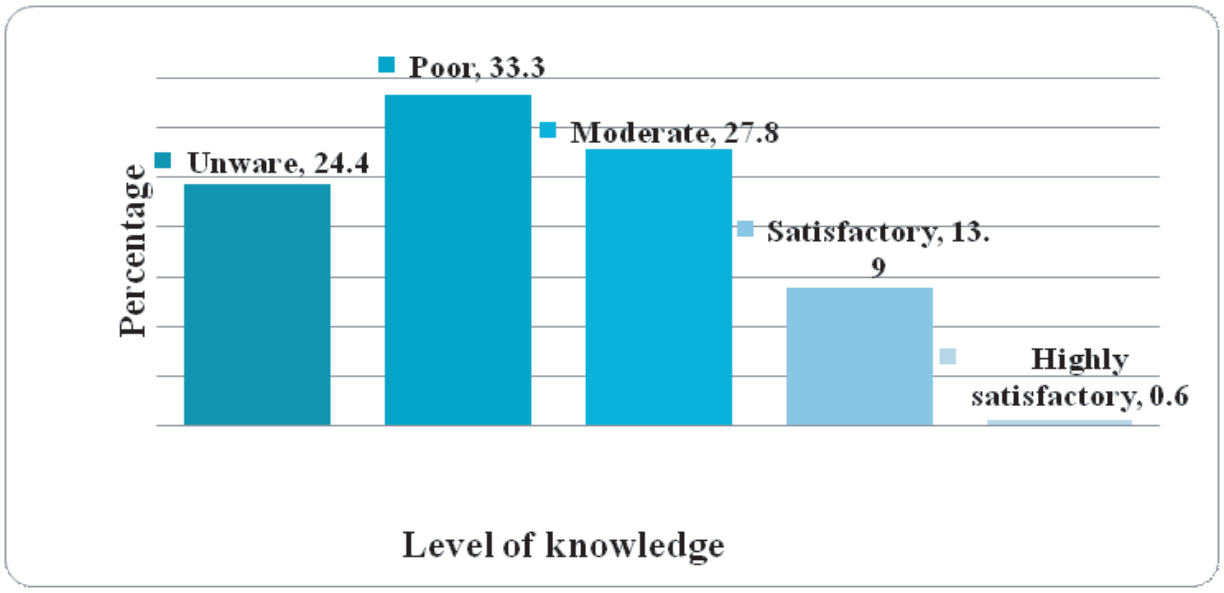

Figure III : Respondents Knowledge about third-hand smoke (n = 180)

Discussion

The findings presented earlier, need to be discussed further to come to a conclusion. Over 20% of the respondents were smokers. Among them, 59.5% were smoking for 10 years or more than 10 years. In response to a question on the knowledge of the respondents about third-hand smoking, majority (91.1%) of respondents answered it harmed people around the smoker(that is second hand smoke) and 23.9% told it harmed even after the cigarette is extinguished (yesterday's smoking can harm today).Whereas a study in Spain among 1036 parents conducted by Ana Díez-Izquierdo in the year 2017, a total of 27% of the respondents had heard about Third Hand Smoke and also found significant differences among smoking status, being the smokers who declare higher knowledge about it. In that study, total of 86% of the respondents believed that Third Hand Smoke is harmful to their children. This was the first study in Europe to describe the knowledge and belief of Third Hand Smoke. Around 3 out of 10 parents have heard about Third Hand Smoke and more than 8 out of 10 parents believed that Third Hand Smoke is harmful to their children[8].

Againaccording to Jonathan Winickoff's study conducted in USA in the year 2009, of the 1,500 smokers and non-smokers surveyed, the vast majority agreed that second-hand smoke is dangerous. Asked about whether they agreed with the statement, that breathing air in a room today where people smoked yesterday can harm the health of infants and children, 65% of non-smokers and 43% of smokers nodded that remnants of smoking could harm people even after the cigarette is put out.2Subsequently in the current study, about two-third (65.6%) of the respondents said they feel discomfort due to smell of cigarette smoke. About the harmful effect smoking remnants on people around the smoking zone, over 40% of the respondents opined that remnants of smoking could harm people around the smoking zone. As respondents were asked whether they would support smoking anymore, majority (91%) denied to some further. The respondents' level of knowledge was subdivided into five categories, such as, unaware,

poor, moderate, satisfactory knowledge and highly satisfactory as described in the methodology section. Accordingly, about one-quarter (24.4%) of the respondents was unaware of the third-hand smoking and only 0.6% highly satisfactory knowledge.

Conclusion

In the light of the findings of the present study and discussion thereof, it could be concluded that although third-hand smoking is a new concept in the field of public health, people by their experience possessed a good level of knowledge about the harmful effect of third-hand smoking. However, there are scopes for further improvement of knowledge about third hand smoking.

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Original Article

An Anthropometric Study of Foot Length and its Relationship with Stature on Bangladeshi Garo People

Ahmed Z [1], Kabir A [2], Farjan S [3], Epsi EZ [4], Ajmery S [5]

1. ** Dr.Zubayer Ahmed, Assistant Professor (CC), Department of Anatomy, Cox's Bazar Medical College.*
2. *Dr. Anamul Kabir, Assistant Professor, Department of Anatomy, Jahurul Islam Medical College.*
3. *Dr. Sumaya Farjan, Assistant Professor, Department of Anatomy, Khulna City Medical College.*
4. *Dr. Effat Zerin Epsi, Lecturer, Department of Anatomy, Mymensingh Medical College.*
5. *Dr. Suny Ajmery, Assistant Professor, Department of Pharmacology, Jahurul Islam Medical College.*

** For Correspondence*

Abstract

Objectives: *The present cross sectional descriptive type of study provides a standard for Bangladeshi Garo people regarding their foot length & its relationship with stature*

Methods: *A cross sectional descriptive study was conducted at different areas of Mymensingh (Haluaghat, Vatikashor and Kachijhuly) from July 2015 to June 2016 on 101 Bangladeshi Garo people. Among them 60 were male and 41 were female. Sample collection was done by nonrandom purposive sampling technique. Mixed ethnicity and any kind of foot deformity resulting either from congenital or physical injury were excluded to construct standard measurement for Garo ethnicity. Foot length was measured using slide calipers. The subjects were asked to stand with weight distributed equally on both feet. The legs were perpendicular to the feet. Data were tabulated and statistically analyzed using Microsoft excel and SPSS software.*

Results: *The maximum right and left foot length for male was found 20.91 cm and 20.92 cm respectively, minimum was 27.61 cm and 27.60 cm respectively. In case of female maximum foot length for both feet was 20.40 cm and minimum was 23.93 cm and 23.90 cm for right and left foot respectively. In this study, difference of mean foot length of male and female were statistically analyzed by using students unpaired 't' test which was highly significant. Correlation was done with stature and found significant in both male and female.*

Conclusion: *The results of this study would be useful for physical anthropologist, Forensic Medicine experts, plastic and reconstructive surgeon.*

Key words: *Anthropometry, foot length, Garo people, stature.*

Introduction

The human foot, the foundation of bipedal locomotion, is a highly complex multi-bone structure with 26 major bones and 32 synovial articulations. The normal foot shows great individual variation in length and breadth in males and females.Anthropometry is the study of the measurement of the human body in terms of the dimensions of bone, muscle and adipose tissue. The word "anthropometry" is derived from the Greek word "anthropo" meaning "human" and the Greek word "metron" meaning "measure" [1]. In adults, body measurement data are used to evaluate health and dietary status, disease risk and changes of body composition that occur over the adult lifespan [2].

Foot anthropometric data are particularly important to be used in producing shoes which are the important equipment and essential need for people. For suitable design of shoes, foot dimensions of consumers are required. Length, widths and heights of feet should be matched with shoes in order for footwear to be comfortable. In the production of shoes and stocking, standardization of size is an important concern [3]. The Garo people are the indigenous people in Meghalaya, India and neighboring areas of Bangladesh like Mymensingh, Netrokona and Sylhet who call themselves "A-chik Mande" literally means hill people, from a-chik means bite soil and mande means people.

According to one such oral tradition, the Garos first immigrated to Garo hills (East-West Garo hills) from Tibet around 400BC crossing the Brahmaputra River and settling in the river valley. From there they are distributed over the Kamrup, Goalpara and Karbi Anglong districts of Assam, Garo Hills and a few in Khasi Hills in Meghalaya. About 200,000 are found in greater Mymensingh (Tangail, Jamalpur, Sherpur, Netrokona, Mymensingh Sadar) and Capital Dhaka, Gazipur, Sirajgonj, Rangpur, Sunamgonj, Sylhet & Moulovibazar districts of Bangladesh.

In our country, we depend on foreign data which came from the subjects of different races and from the individuals under different geographic condition. The present study was carried out to minimize the dependency on foreign standards regarding foot length and to establish a standard for 20-40 years aged Garo people residing in Bangladesh.

Method and Material

This study was carried out at Vatikashor and Kachi-jhuli in Mymensingh Sadar and at Haluaghat thana of Mymensingh from July 2015 to June 2016. The study was cross sectional, observational and descriptive type with some analytical component.

The participants were selected through purposive sampling technique. Total 101 Garo people (60 male and 41 female) were selected for the study.

Subject were informed about the total plan of the study and also about the entire spectrum and benefits of the study. A written informed consent was taken from each participant.

Stature was measured from a standing surface to the top of the head with a stadiometer. The subject stands erect with the head in the Frankfurt plane. The heels are together with the weight distributed equally on both feet. The shoulders and upper extremities are relaxed [4].

The foot length was measured from the most posterior prominence of the heel (pternion), to the tip of the longest toe (acropodion), usually the first toe, in other cases second toe may be the longest. The apparatus used for this study is slide calipers. The subjects were asked to stand with weight distributed equally on both feet. The legs were perpendicular to the feet [5].

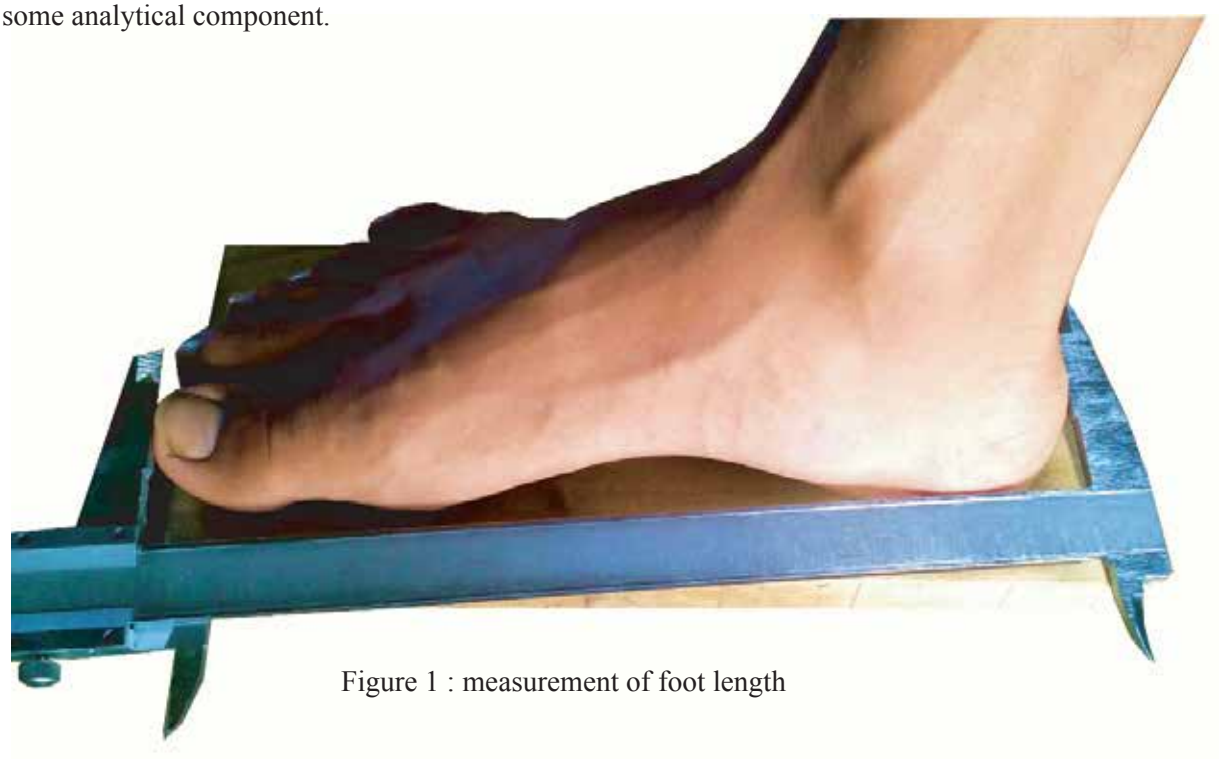

Figure 1 : measurement of foot length

Results

The foot length of 60 males ranged from 20.91 to 27.61 cm in 20-40 years aged Garo people. More than 75% of the respondents were measured from 23 cm to 26 cm, where as 41 females of same age range, more than 65% of the respondents were measured from 21.5 cm to 23 cm. The range of foot length for female was from 20.40 to 23.93 cm.

Table I: Foot length in Garo male and female

Variable	Sex		Measurement (cm)		
			Range	Mean	±SD
Foot length	Male	Right	20.91- 27.61	24.38	1.29
		left	20.92-27.60	24.39	1.28
	Female	Right	20.40-23.93	22.22	0.81
		left	20.40-23.90	22.20	0.78

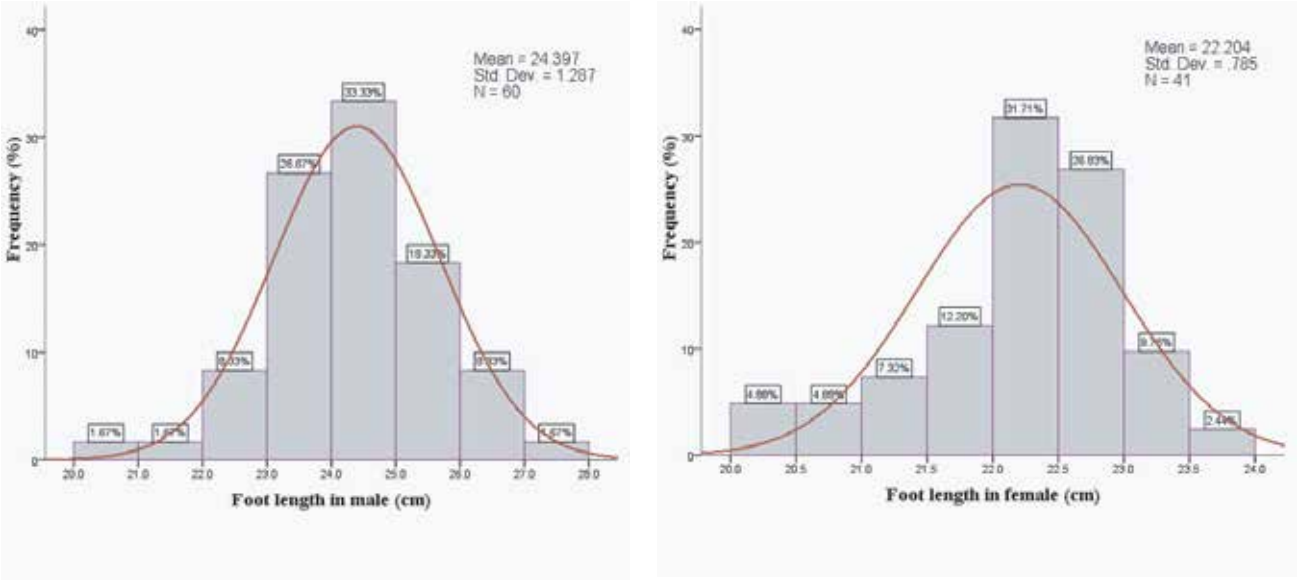

Figure 2 : Foot length in Garo male and female

Table II: Comparison of means of foot length between male and female

Variable	Mean difference	Std. error	'P' value
Foot length	2.152894	0.226226	0.000 HS

HS= Highly-significant at 5% level of significance on two sample independent t-test.

Statistical analyses showed that the difference between male and female mean foot length was found to be highly significant (table II). Both right and left foot length shows significant positive correlation with stature in male (r=0.609, p=0.000 for right foot and r=0.606, p=0.000 for left foot). And female also shows significant positive correlation (r=0.515, p=0.001 for right foot and r=0.501, p=0.001 for left foot) between foot length and stature.

Table III: Correlation between stature and foot length

Variable (cm)			Correlation with stature	
			r	p-value
Foot length	Male	Right	0.609	0.000 HS
		left	0.606	0.000 HS
	Female	Right	0.515	0.001 HS
		left	0.501	0.001 HS

r = Pearson correlation

HS = Highly Significant at 5% level of significance

Discussion

Present study shows Garo male have mean foot length 24.38±1.29 cm and female have 22.22±0.81 cm.Ahmed et al. [6] conducted a study on foot anthropometry among Santhal and Bangladeshi adult male at Pirganj in Rangpur and described the mean foot length 25.1±1.2cm for Bangladeshi male which is higher than that of the present study, whereas the mean foot length for Santhal people was 24.6±1.4 cm which is more or less similar to present study.

Dewangan, Owary and Datta[7] conducted an anthropometric study on male agricultural workers of north-eastern India and described the mean foot length 24.0±1.1 cm for the male agricultural workers which is more of less similar to present study.

Agnihotri, Shukla and Purwar[8] conducted an anthropometric study on 125 adult male and 125 adult female. They found the mean foot length for male 26.17±1.05 cm which is higher than the present study, whereas in female mean foot length 23.08±1.08 cm which is also higher than the present cant positive correlation with both right and left foot length in both male and female study. Castro, Rebelatto and Aurichio [9] conducted a study in the city of São Carlos, SP, Brazil and found mean foot length 24.0±1.1 cm for female and mean left foot length 25.9±1.2 cm for male, both of which is higher than the present study.Kanaani et al. [10] conducted a study on 18-25 aged Iranian male and described the mean foot length 26.4±1.3 cm which is higher than the present study.Chiroma et al. [11] conducted a study among adult Ga'anda people of Nigeria and described the mean foot length in male 26.45 ± 1.5 cm and in female 25.17 ± 1.7 cm, both of which are higher than the present study. Difference between mean values of male and female foot length breadth was statistically analyzed by students unpaired 't' test and significant difference was found.

Correlation between stature and foot length was done. The stature had been found to have signifi

Conclusion

The mean foot length was found 24.38±1.29 cm in case of male and 22.22±0.81 cm in case of female. Male shows higher mean foot length than female. This difference between male and female was statistically significant.

The stature had been found to have significant positive correlation with both right and left foot length in case of both male and female.

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Original Article

Comparative Study of Dexmedetomidine and Fentanyl as an adjuvant to 0.25% Bupivacaine in Supraclavicular Brachial Plexus Block for Upper limb Surgeries

Ahmed R[1], Shaheen MSA[2], Talukder S [3] , Islam MR [4]

*1. * Dr.Raju Ahmed, Assistant Professor, Department of Anaesthesiology, Ibrahim Cardiac Hospital and Research Institute .*

2. Dr. Md. Shafiul Alam Shaheen, Assistant Professor, Department of Anaesthesiology, Ibrahim Cardiac Hospital and Research Institute .

3. Dr. Shaurav Talukder, . Assistant Professor, , Department of Anaesthesiology & ICU, Jahurul Islam, Medical College

4. Dr. Md. Rafiqul Islam, Professor, Department of Anaesthesiology *& ICU, Jahurul Islam, Medical College*

** For Correspondence*

Abstract

Background: *Brachial plexus block is gaining popularity day by day for upper limb surgery. The supraclavicular brachial plexus block may be used for upper limb surgery alone or in conjunction with general anaesthesia.*

Objectives: *The aim of the study was to compare the onset and duration of sensory and motor blockade with the quality of perioperative analgesia and postoperative complications provided by dexmedetomidine and fentanyl as adjuvants to 0.25% bupivacaine in supraclavicular brachial plexus block of upper limb surgeries.*

Material and method: Eighty(80) patients with American Society of Anaesthesiologists class I/II scheduled for elective upper limb surgeries were randomly allocated into two groups .Group D received 40ml of 0.25% bupivacaine with 1 μg/kg dexmedetomidine, and group F received 40ml of 0.25% bupivacaine with 1 μg/kg fentanyl for supraclavicular brachial plexus block. The onset and duration of sensory and motor block and adverse events during the perioperative period were noted.

Results: *The onset of sensory blocked was 14.93±1.34 min in the group D and 15.16± 1.41 min in the group F which was not statistically significant difference between the two groups (p=0.45). But there was a highly significant statistical difference in the duration of sensory blockade, i.e. 751.75±8.07 min with dexmedetomidine group compared to 540.25±2.41 min with fentanyl group (p<0.0001). The duration of motor blockade was highly significant with 599.5±12.73 min in group D compared to 406.75±2.93 min in group F (p<0.0001).*

Conclusion: *Dexmedetomidine prolongs the duration of sensory and motor block and postoperative analgesia as compared to fentanyl when used as an adjuvant to 0.25% bupivacaine in supraclavicular brachial plexus block and is not associated with any major adverse effects.*

Key words: *Bupivacaine, Dexmedetomidine, Fentanyl, Supraclavicular brachial plexus block.*

Introduction

Brachial plexus block is the most popular technique to deal the upper limb surgeries. There are many approaches followed to achieve this block like supraclavicular, infraclavicular, interscalene also the axillary approach. But amongst all of them, the supraclavicular approach to achieve the brachial plexus block is the easiest technique and most consistent method for anaesthesia in surgeries below the shoulder joint. Various adjuvant, including opioids, midazolam, magnesium sulphate, dexamethasone, and neostigmine have been added to local anaesthetic in an attempt to increase the duration of block and postoperative analgesia [1].

Dexmedetomidine is a highly selective α2-adrenergic receptor agonist, and it has a sedative, anxiolytic, analgesic, antihypertensive and sympatholytic properties [2]. Its use in peripheral nerve blocks has recently been described. It has been reported to have

a rapid onset time, to prolong the duration of local anaesthetics, and it is approximately 8 times more potent than clonidine and is also reported as safe and effective in peripheral nerve block3.

Opiates are widely known to have an analgesic effect at the central and spinal cord level. However, opioid analgesia can be initiated by activation of peripheral opioids receptor. Opioids such as fentanyl have been used for regional nerve plexus blocks to improve the block duration and quality. The peripheral administration of opioids provides stronger and longer lasting analgesia without central side effect [4]. Studies have shown better block duration and success rate of brachial plexus block on addition of fentanyl.Various clinical trials have been found that administration of dexmedetomidine and fentanyl with local anaesthetics in neuraxial and peripheral nerve blocks prolonged the duration of sensory and motor blockade[5]. However, there were limited data available on comparing of dexmedetomidine and fentanyl as addition to local anaesthetic in brachial plexus block [6].

Our goal in this prospective, single blind, randomized study was to compare the two adjuvants, dexmedetomidine and fentanyl, in terms of efficacy, duration of block and any side effects.

Materials & Methods

This randomized single-blind study was conducted from 1st January '2015 to 31st December '2016 at the department of Anaesthesiology and Surgical ICU, BIRDEM General Hospital, Shahbagh, Dhaka, Bangladesh. After institutional ethical committee approval and informed written consent, a total number of 80 adult patients were randomly allocated into two groups (n=40) using a computerized random number table. Patients with ASA physical status I & II, aged between 18 to 60 years, scheduled for upper limb surgeries were enrolled in this study.

Exclusion criteria included local infection at the site of puncture, patients having any neurological deficit in the upper limb, severe renal, hepatic, respiratory, hematological disorders and known allergy to study drugs.Group D received 40ml of 0.25% bupivacaine with 1 µg/kg dexmedetomidine, and group F received 40ml of 0.25% bupivacaine with 1 µg/kg fentanyl for supraclavicular brachial plexus block. Preoperative assessment included detailed history, physical examination, systemic examination, airway assessment and routine investigations, such as hemoglobin, total blood cell count, differential white blood cell count, platelet count, blood glucose, blood urea and serum creatinine. ECG and X-ray were also performed. The block procedure and the Visual Analogue Score (VAS) were also explained to the patient. Preoperative baseline vital parameters were recorded. Intravenous line was secured with an 18G canula, and infusion was started. Premedication was given with inj. Ondansetron 4 mg iv, inj. Ranitidine 50 mg iv and inj. Midazolam 0.03mg/kg iv. After aseptic precautions, skin infiltration was given with 1 ml of 2% lignocaine. Supraclavicular brachial plexus block was performed with USG guidance. The onset of sensory and motor blockade was assessed every 5, 10, 15, 20, 30 min until complete sensory or motor block. The onset of sensory block was assessed by a pinprick method and defined as the time from the completion of local anaesthesia injection to the time when sensory block was detected. The onset of motor block was measured as the time between the completions of local anaesthesia injection to the time when motor block was detected. The onset of motor block was measured as the time between the completion of local anaesthesia injection to the achievement of score 3 of the modified Bromage scale. If anaesthesia was found inadequate after 30 min of administration of the drug, such patients were excluded from the study. On arrival to the operating theater, the vital signs parameters including mean arterial blood pressure (MAP), heart rate (HR), respiratory rate, and SpO2 were recorded at base line, 15, 30, 45, 60, 75, 90, 120 min. After completion of surgery, the patients were monitored in the post-anaesthesia care unit. HR and blood pressure were recorded every hour for 6 h. Post-operative pain was assessed by using visual analog scale (VAS) scoring from 0 to 10. Score 0: no pain. Score 10: maximum imaginable pain. Rescue analgesia was given if VAS >4. The following side effects were observed: nausea, vomiting, episode of hypotension (20% decrease in MAP in relation to baseline values), bradycardia (HR <50 beats/min),

and hypoxemia (SpO2 <90%). If systolic blood pressure is <20% from base line or MAP <60 mmHg, IV ephedrine 5 mg was given incrementally. If the HR is <50 beats/min, 0.6 mg atropine sulfate was administrated. Any complication including vascular puncture, Horner's syndrome, pneumothorax, and phrenic nerve palsy were recorded. Furthermore, any side effects of dexmedetomidine such as dry mouth, hypotension, bradycardia, or sedation were recorded. All data presented as mean ±(standard deviation) unless otherwise indicated. Unpaired student t test and chi-square test was done for hypothesis testing among the two groups. Data collected on a predesigned data collection sheet and later on compiled on a master chart. A p value of <0.05 accepted as statistically significant. Statistical analysis carried out using Statistical Package for Social Science (SPSS) for Windows version 17.0. In the intraoperative and postoperative period the heart rate (Figure 3) and the mean arterial blood pressure (Figure 4) were decreased in both groups but statistically not significant (p >0.05). Single dose of rescue analgesia was given in eight patient in group F with a VAS score ≥4 cm when needed. Table 4 showed that the postoperative complications like bradycardia was seen in one patient in group D, nausea and vomiting was seen in two patient in group F and hypotension was seen in two patient in group D which was not statistically significant (p > 0.05) but in group D sedation was found in six patients which was statistically significant (p < 0.05). ASA catagorization (I, II) of group D was 30/10 and of group F was 32/08 patients. No cases of cardiac depression or central nervous system toxicity caused by vascular absorption or direct intravascular injection of local anaesthetic occurred. Our postoperative repeated visits for early detection of pain and provide increased patient satisfaction.

Result

Eighty patients who underwent upper limb surgery were enrolled in this study. Among them 51 male and 29 female. Demographic data for each group was similar (Table1). There was no statistically significant difference among the two groups with regard to the duration of surgery and the distribution of cases of ASA I and II (Table 1). The onset of sensory blockade was 14.93±1.34 min in the group D compared to 15.16± 1.41 min in the group F (Figure 1). There was no statistically significant difference between the two groups (p=0.45). Although there was no difference in the onset of action of sensory blockade among the study groups, but there was a highly significant statistical difference in the duration of sensory blockade, i.e. 751.75±8.07 min with dexmedetomidine as adjuvant compared to 540.25±2.41 min with fentanyl (p<0.0001) (Table 2). The onset of motor blockade was not statistically significant among the study groups, but the duration of motor blockade was highly significant with 599.5±12.73 min in group D compared to 406.75±2.93 min in group F (p<0.0001) (Table 3). Sensory block was lasted for a longer duration than motor blockade (Figure 2).

Table 1 : Demographic variables

Variables	Group -D	Group -F	p value
Age (years)	50.40±11.12	52.20±12.55	0.56 ns
Sex (M/F)	26/14	25/15	0.78 ns
Weight (kg)	65.30±9.44	66.67±8.13	0.55 ns
ASA grade (I/II)	30/10	32/08	0.788 ns
Duration of surgery (min)	88.82±2.85	89.12±2.59	0.69 ns

All values were presented as mean ± SD or in frequencies. Data were analysed using unpaired student t-test. Statistically significance was set at p -value <0.05. (S=significance, NS=not significant)

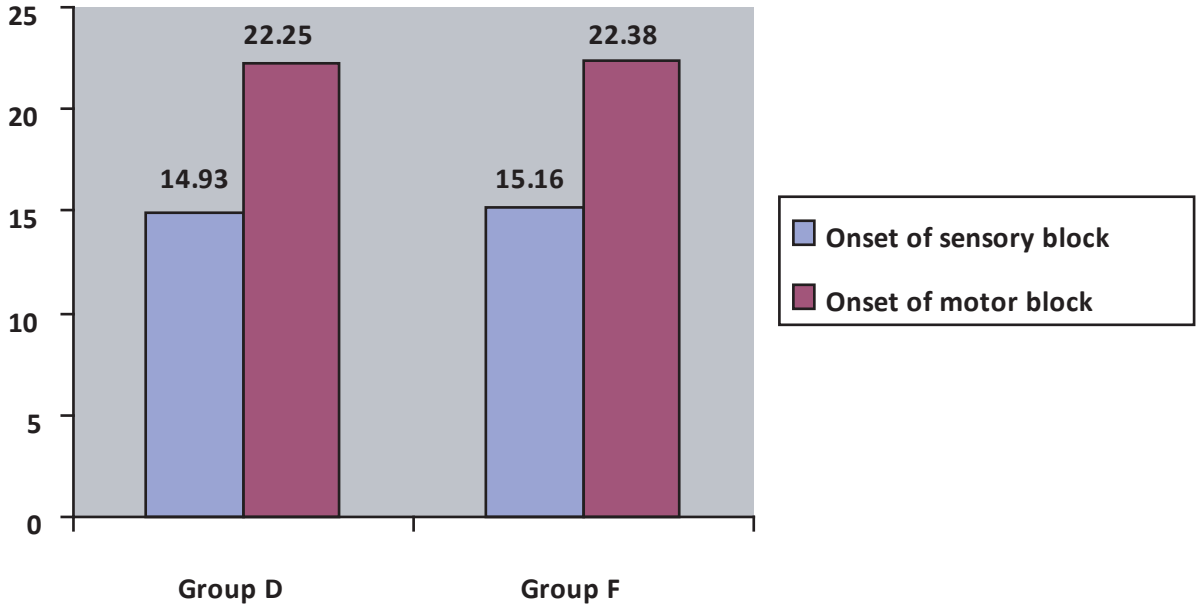

Figure 1 : Onset of sensory and motor block (min)

The onset of sensory blockade was 14.93min in the group D compared to 15.16min in the group F and the onset of motor blockade was 22.25 min in the group D compared to 22.38 min in group F.There was no statisticallysignificant difference between the two groups (p=0.45).

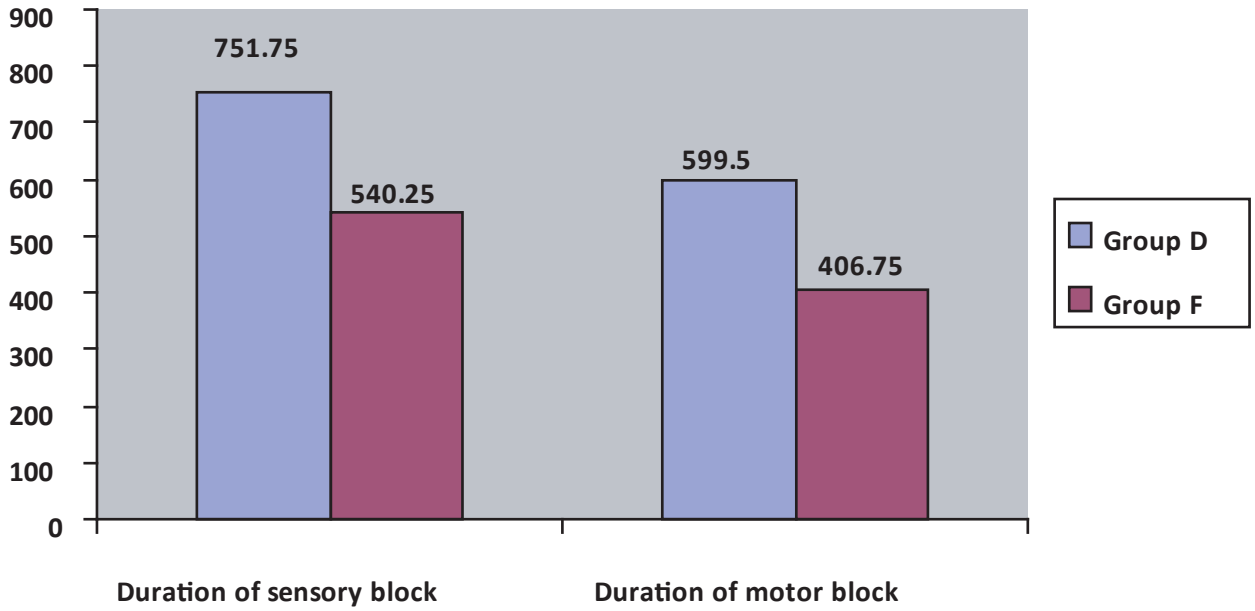

Figure 2: Duration of sensory and motor block (min)

The duration of sensory blockade, i.e. 751.75±8.07 min with dexmedetomidine as adjuvant compared to 540.25±2.41 min with fentanyl (p<0.0001). The duration of motor blockade was also significant with 599.5±12.73 min in group D compared to 406.75±2.93 min in group F (p<0.0001).

Table 2 : Onset and duration of sensory block (min)

	Group D	Group F	P value
Onset of sensory block	14.93±1.34	15.16±1.41	0.45 NS
Duration of sensory block	751.75±8.07	540.25±2.41	<0.0001 S

All values were presented as mean± SD or in frequencies. Data were analysed using unpaired student t-test. Statistically significance was set at p-value <0.05. (S=significance, NS=not significant) Table 2 showed that there was a highly significant statistical difference in the duration of sensory blockade, i.e. 751.75±8.07 min with dexmedetomidine as adjuvant compared to 540.25±2.41 min with fentanyl (p<0.0001).

Table 3 : Onset and duration of motor block (min)

	Group D	Group F	P value
Onset of motor block	22.25±1.56	22.38±1.46	0.77 NS
Duration of motor block	599.5±12.75	406.75±2.93	<0.0001 S

All values were presented as mean± SD or in frequencies. Data were analysed using unpaired student t-test. Statistically significance was set at p-value <0.05. (S=significance, NS=not significant) Table 3 showed that the duration of motor blockade was highly significant with 599.5±12.73 min in group D compared to 406.75±2.93 min in group F (p<0.0001).

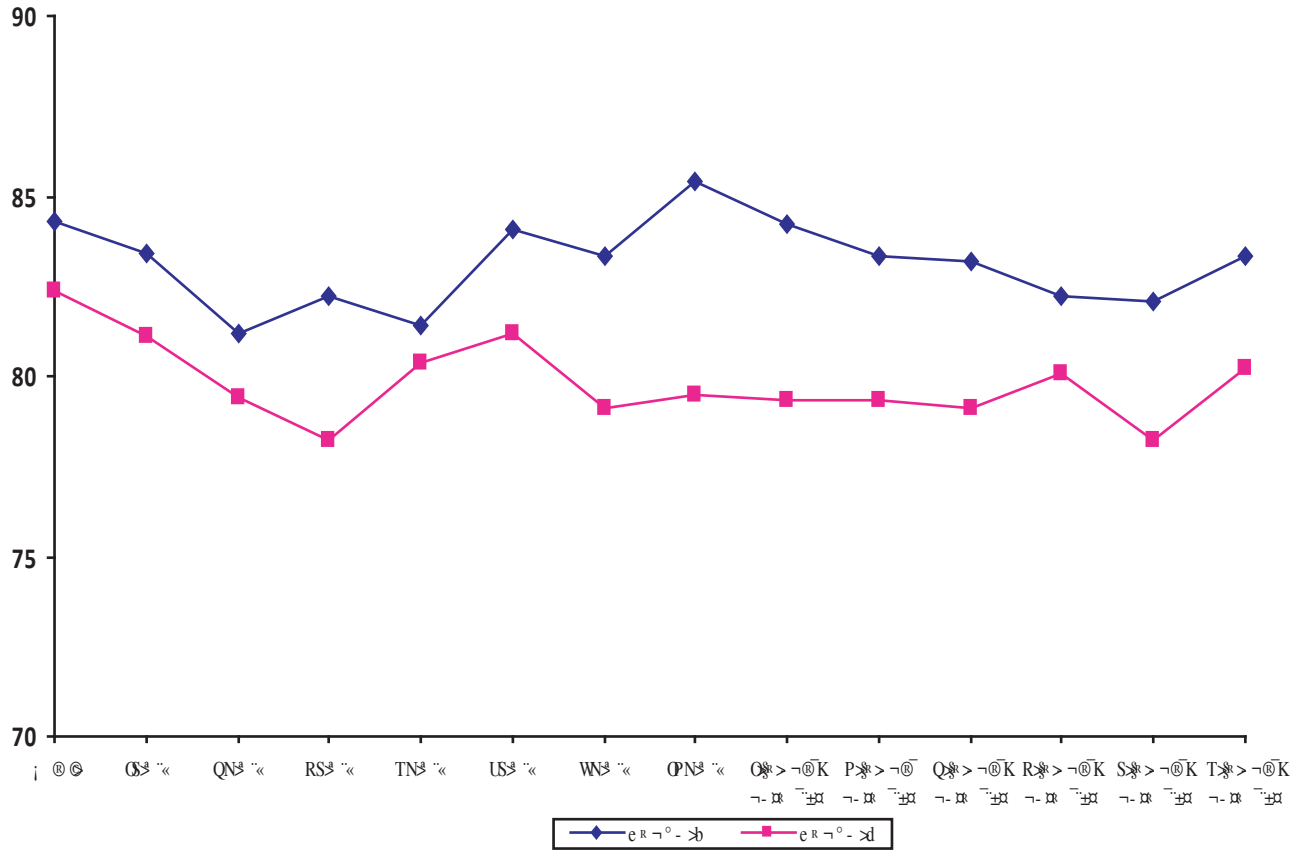

Figure3: Line diagram showing per and post-operative heart rate in two groups

The mean heart rate at different time in peroperative period compared between two groups. No statistical significant were observed in between groups (p > 0.05)

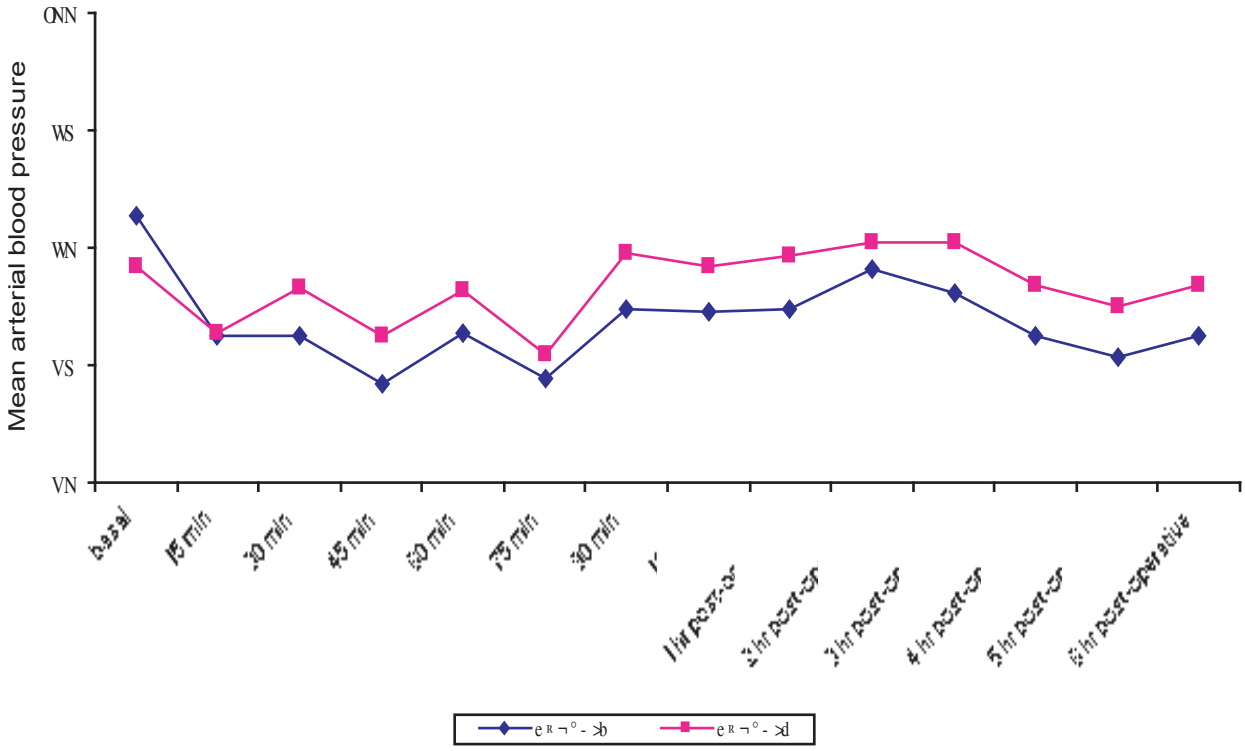

Figure 4: Line diagram showing per and post-operative mean arterial blood pressure in two groups

The mean arterial blood pressure at different time in peroperative period compared between two groups. No statistical significant were observed in between groups (p> 0.05)

Table 4 : Comparison of postoperative complications of the study respondents (n=80)

Complications	Group -D: Case (n=40)	Group -F: Control (n=40)	p value
Bradycardia	01	00	1.00 NS
Nausea and vomiting	00	02	1.00 NS
Hypotension	02	00	1.00 NS
Sedation	06	00	0.025 S
Respiratory depression	00	00	00

All values were presented as mean± SD or in frequencies. Data were analysed using unpaired student t-test. Statistically significance was set at p-value <0.05. (S=significance, NS=not significant) Table 4 showed that the postoperative complications like bradycardia was seen in one patient in group D, nausea and vomiting was seen in two patient in group F and hypotension was seen in two patient in group D which was not statistically significant (p > 0.05) but in group D sedation was found in six patient which was statistically significant (p < 0.05).

Discussion

Our study shows that addition of dexmedetomidine to bupivacaine for supraclavicular nerve block leads to remarkably but not significantly earlier onset of sensory and motor block (P=0.45) than addition of fentanyl to bupivacaine.(Figure : 1)

But our study clearly shows that the analgesia i.e the duration of sensory and motor blockade of study group have statistically significant difference with that of the compared group ($p < 0.0001$ & $P < 0.001$ respectively) (Figure: 2)

Dexmedetomidine is a centrally acting alpha-2 agonist mediating antinociception via peripheral alpha-2 adrenoceptors. Clonidine, another centrally acting alpha-2 agonist that is much less selective, has also been used as an adjuvant to local anaesthesia [7-10]. The effect of addition of dexmedetomidine to bupivacaine [11,12] has been studied and found to be effective with no postoperative neurological deficits.Fentanyl is a potent synthetic opioid analgesia with a strong agonistic action at the μ-opioid receptor with a rapid onset and short duration of action. Fentanyl when added to local anaesthesia in peripheral nerve blocks, potentiates the local anaesthesia action via central opioid receptor-mediated analgesia by the peripheral uptake of fentanyl to the systemic circulation[13,14]. In the present study, 1μg /kg of fentanyl was used together with 40ml of 0.25% bupivacaine. The onset of sensory and motor blockade and duration of postoperative analgesia was significantly prolonged with dexmedetomidine as adjuvant compared to fentanyl.

Marhofer et al.[15] added dexmedetomidine as adjuvant to ropivacaine in a USG-guided ulnar nerve block and showed that the time for the onset of motor block is decreased without effect on time to the onset of sensory block.

The duration of both sensory and motor block was prolongedRancourt et al.[16] did a prospective, randomized,controlled, double-blind, crossover trial in 14 healthy volunteers who received a USG-guided tibial nerve block. Ropivacaine alone and in combination with dexmedetomidine was studied. It was observed that dexmedetomidine added to ropivacaine for tibial nerve block prolongs the duration of sensory blockade.

Das et al.[17] studied 84 patients posted for elective forearm and hand surgeries to evaluate the effect of adding dexmedetomidine to ropivacaine for supraclavicular brachial plexus blockade. It was found that the onset of block is earlier, and the duration of action is prolonged in dexmedetomidine than ropivacaine alone.

In our study technical complications of supraclavicular brachial plexus such as hematoma and pneumothorax were not observed. No respiratory depression was observed in any patient of the study. Sedation was seen in 6 patients in the dexmedetomidine group compared to none in the fentanyl group. The difference was not statistically significant and clinically did not require any intervention. Hypotension was noted in two patients of dexmedetomidine group. Bradycardia occurred in one patient of dexmedetomidine group. Incidence of nausea and vomiting was recorded in fentanyl group in two patients only. (Table 4)

However, our study had few limitations. First, expense and unavailability of dexmedetomidine vials. Second, the plasma level of the study drugs was not measured.

Conclusion

Dexmedetomidine causes early onset of sensory and motor block. It prolongs the duration of sensory and motor block and postoperative analgesia as compared to fentanyl when used as an adjuvant to 0.25% bupivacaine in supraclavicular brachial plexus block and is not associated with any major adverse events.

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Original Article

Evaluation of the necessity of axillary lymph node dissection (ALND) based on the tumor size in carcinoma breast.

Saad S[1], Hossain SMA [2], Alam KABMT [3], Islam M [4], Akteruzzaman SM [5]

*1. * Dr. Sanjeeda Saad, Assistant Professor, Dept. of Surgery,Jahurul Islam Medical College Hospital, Bajitpur, Kishoregonj.*

2. Prof. Dr. SM Amjad Hossain, Professor, Dept. of Surgery,Dhaka Medical College Hospital, Dhaka.

3. Dr. KABM Taiful Alam, Associate Professor, Dept. of Surgery,Jahurul Islam Medical College Hospital, Bajitpur, Kishoregonj.

4. Dr. Majedul Islam, Assistant Professor, Dept. of Surgery,Jahurul Islam Medical College Hospital, Bajitpur, Kishoregonj.

5. Dr.S.M. Akteruzzam, Senior consultant Surgery 250 bed General Hospital, Kustia.

*** For Correspondence**

Abstract

Background:*Globally, breast cancer is the most frequently diagnosed cancer and the leading cause of cancer death in females, accounting for 23 percent of total cancer cases and 14 percent of cancer deaths.*[1]*Breast cancer is now also the leading cause of cancer death among females in economically developing countries. Overall lifetime probability of developing breast cancer is one in six (one in eight for invasive disease).*[2] *In Bangladesh breast cancer is the 2nd most common cancer and also 2nd most leading cause of cancer death among the female population after cervical cancer.*[3]

Methods: *This was a Prospective Observational cross-sectional study conducted among the 150 adult female patients of breast carcinoma admitted in Department of surgery, Dhaka Medical College & Hospital, Bangabandhu Sheikh Mujib Medical University during July 2012 to June 2013. After reporting in surgery department, patients with breast lump were evaluated by history and physical examinationby the study physician. Diagnosis was made by ultrasonography or mammography and confirmed by FNAC. Tumor size was measured by physical examination, ultrasonography or mammography and during histopathological slide preparation. Histopathology of the dissected axillary lymph nodes determined the axillary lymph node status. Case record forms with appropriate questionnaire were filled for all patients.*

Results: *This prospectively documented study enrolled 150 cases of diagnosed breast cancer patient. The mean (+SD) age of the patients was 42.16 + 11.18 years with the range from 18 – 65 years. Majority of study population were clinically encountered at Stage II (52%) during diagnosis. Regarding histology, 52% tumors were at T2 stage. Histologically 66% population showed metastasis of tumor cells in the axillary lymph node(s). Frequency of axillary lymph node metastasis increased as the tumor size increased. We found 33.33% T1 tumors had axillary lymph node metastasis, whereas 58.97% T2 tumors and 93.75% T3 tumors showed axillary lymph node metastasis respectively.*

Key words:*Carcinoma, Carcinoma of breast, Axillary lymph nodes*

Introduction

Globally, breast cancer is the most frequently diagnosed cancer and the leading cause of cancer death in females, accounting for 23 percent of total cancer cases and 14 percent of cancer deaths[1].Breast cancer is now also the leading cause of cancer death among females in economically developing countries. The lifetime probability of developing breast cancer is one in six overall (one in eight for invasive disease)[2].

In Bangladesh breast cancer is the 2nd most common cancer and also 2nd most leading cause of cancer death among the female population after cervical cancer[3].Breast cancer incidence rates are highest in North America, Australia/New Zealand, and in western and northern Europe and lowest in Asia and sub-Saharan Africa[1,4]. Despite the decreases in incidence rates in North America, breast cancer incidence has been increasing in other parts of the world, such as Asia and Africa. These international differences are thought to be related to societal changes occurring during industrialization (e.g. changes in fat intake, body weight, age at menarche, and/or lactation, and reproductive patterns such as fewer pregnancies and later age at first birth)[5,6].

About one-half of the cases of breast cancer can be explained by known risk factors and additional 10 percent are associated with a positive family history. Many risk factors have been associated with breast cancer, such as: older age, female sex, early age at menarche,later age at first full-time birth, less breastfeeding, late menopause, use of endogenous and exogenous hormones, dense breasts, and proliferative breast disease.

The presenting complaint in about 70% of patients with breast cancer is a lump (usually painless, 20% as a painful lump) in breast. Less frequently; 10% of patients present with nipple change(erosion, retraction, enlargement or itching of the nipple), 3% of patients present with nipple discharge, 5% of patients present with skin contour changes, redness, generalized hardness, enlargement or shrinking of the breast[7]. Rarely an axillary mass or swelling of the arm may be the first symptom. Back or bone pain, jaundice, weight loss may be the result of systemic metastasis but are rarely seen on initialpresentation[8]. The treatment of breast cancer includes the treatment of loco regional disease with surgery, radiation therapy, or both, and the treatment of systemic disease with one or a combination of chemotherapy, endocrine therapy, or biologic therapy [9].Tumor size has long been recognized as an independent prognostic factor and as a predictor of axillary node status, with larger tumors being associated with a worse prognosis and an increased likelihood of nodal metastasis[10].

Worldwide standard treatment of carcinoma breast is mastectomy with axillary lymph node dissection (ALND). The dissection provides accurate prognostic information as well as excellent local control and improves the survival rate in the node positive group[11]. On the other hand axillary lymph node dissection can result in various early complications like infection, seroma and hematoma as well as late complications like edema, paresthesia, stiffness, pain and weakness of the upper extremity. Arm problems are frequent after operation for breast cancer, and these problems appear to increase the likelihood of psychological distress. So axillary lymph node dissection is now no longer considered to be the standard treatment in all patients with invasive breast cancer[12].

Method and Material

This was a Prospective Observational cross-sectional study conducted among the 150 adult female patients of breast carcinoma admitted in Department of surgery, Dhaka Medical College & Hospital and Bangabandhu Sheikh Mujib Medical University during July 2012 to June 2013. After reporting in surgery department, patients with breast lump were evaluated by history and physical examination by the study physician.Diagnosis was made by ultrasonography or mammography and confirmed by FNAC. Tumor size was measured by physical examination, ultrasonography or mammography and during histopathological slide preparation. Histopathology of the dissected axillary lymph nodes determined the axillary lymph node status. Informed written consent was obtained from the patient's attendant after full explanation of the disease process. Evaluation was made by history and physical examination in a structured case record form (CRF) by the study physician. Qualitative data were presented as frequency and percentage and Quantitative variable presented as mean and standard deviation. All data were processed and analyzed manually and by SPSS (Statistical Package for Social Science) 16 windows version.

mean (+SD) age of the patients was 42.16 + 11.18 years with the range from 18 – 65 years. Majority of study population were clinically encountered at Stage II (52%) during diagnosis. Regarding histology, 52% tumors were at T2 stage. Histologically 66% population showed metastasis of tumor cells in the axillary lymph node(s).

Frequency of axillary lymph node metastasis increased as the tumor size increased. We found 33.33% T1 tumors had axillary lymph node metastasis, whereas 58.97% T2 tumors and 93.75% T3 tumors showed axillary lymph node metastasis respectively

Result

This prospectively documented study enrolled 150 cases of diagnosed breast cancer patient. The

Table I: Age distribution of the study patients (n=150).

Age group (years)	No. of Cases	Percentage
10 - 20	12	8%
21 - 30	12	8%
31 - 40	45	30%
41 - 50	57	38%
51 - 60	15	10%
61 - 70	9	6%
Mean ±SD	42.16 ± 11.48	
Median Range (min - max)	42.50 (18-65)	

Table II : Distribution of study population according to clinical symptomatology (n = 150)

Clinical Presentations	No. of Cases	Percentage
1.Painless breast lump	126	84%
2. Painful Breast lump	24	16%
3. Nipple discharge	12	8%
4. Nipple retraction	60	40%
5. Skin ulceration	6	4%
6. Lump in axilla	21	14%

Table lII: Distribution of study population according to clinical characteristics of the breast lump (n=150)

Clinical Character	Findings	No. of Cases7	Percentage
1. Side	Right side	93	62%
	Left side	57	38%
	Upper outer quadrant	77	51.33%
	Upper inner quadrant	20	13.33%
2. Site	Central quadrant	28	18.67%
	Lower outer quadrant	16	10.66%
	Lower inner quadrant	9	6.67`%
3. Number	Single	143	95.33%
	Multiple	7	4.66%
4. Consistency	Firm	45	30%
	Hard	105	70%
	</=2cm	12	8.00%
5. Size	2.1 to 5 cm	99	66%
	>5 cm	39	26.00%

Table IV: Clinical characteristics of the axillary lymph nodes in the study population (n=150)

Clinical Character	Finding	No. of Cases	Percentage
1. Axillary Lymph node	Palpable	90	60.00%
	Not palpable	60	40.00%
2. Number	Single	51	56.66%
	Multiple	39	43.33%
3. Mobility	Mobile	66	73.34%
	Matted	24	26.67%

Table V: Histological characteristics of the tumor in study population (n=150)

Character	Findings	No. of Patients	Percentage
1. Size	Up to 2 cm	24	16%
	2.1 to 5 cm	78	52%
	> 5 cm	48	32%
2. Focality	Unifocal	148	98.67%
	Multi -centric	2	1.33%
3.Histological type of tumor	Infiltrating duct cell carcinoma	146	97.33%
	Others	4	2.67%
4. Histological grading	Grade I	21	14%
	Grade II	87	58%
	Grade III	42	28%
5. Lympho Vascular Invasion	Present	29	19.33%
	Absent	121	80.67%

Table VI: Distribution of study population according to lymph node involvement in relation to size (Histological). (n=150)

Size	No. of Patients	Involvement of Lymph Node		Percentage	P Value
	(n)	Findings	No. of Patients		
1.up to 2cm	24	Involved	8	33.33%	0.034
		Not involved	16	66.67%	
2. 2.1 cm to 5 cm	78	Involved	46	58.97%	
		Not involved	32	41.02%	
3. > 5 cm	48	Involved	45	93.75%	
		Not involved	3	6.25%	

P Value based on Chi -Square test.

P Value <0.05 is statistically significant.

Discussion

Breast cancer is the most frequently diagnosed cancer among women and the leading cause of cancer death in females worldwide.It accounts for 30% of all female cancers and 15% of all cancer related death among women.During the last century axillary lymph node dissection (ALND) had been an effective surgical procedure in initial management of invasive breast cancer.

Although ALND is associated with some complications such as pain, lymph edema and shoulder stiffness. Predicting the status of axillary lymph nodes prior to surgery will help us to determine patients who have an acceptable low risk of ALNI to avoid an unnecessary full ALND. It is a cause for concern if we can use the size of primary tumor as a reliable predictive factor of axillary lymph node invasion (ALNI).

In our study most of the patient was encountered in 41 – 50 years (38%) age group and the mean (±SD) age was 42.16 ± 11.48 years with ranged from 18 to 65 years and majority was older than 40 years. A study of 380 patients in Singapore, done by LGL Tan, YY Tan et al.[13] showed the median age of the subject was 52 years with the range from 24 – 87 years. Elahe Oranget al done their study in Iran where they found mean age of the participants was48.93 ± 12.6 years (ranged from 18 – 90 years).

Symptomatologic analysis of the study population reveals that breast lump (n= 150) is the commonest presentation of which each painless lump predominates (n= 126) . 40% population presented with nipple retraction 40% (n= 60). About 14% patients had associated lump in axilla .Clinical assessment of lump size revealed 66% lumps was in a range from 2.1 - 5 cm and 26% was larger than 5 cm. Only 12 patients had their l umps smaller than 2 cm. In search of advancement of malignancy, we found 60% patient to be node positive clinically. In this study we have observed that we got pT2 tumors in highest number (52%) followed by pT3 tumors (32%) and a little pT1 tumors (16%). Various studies done in India, Korea, USA, Iran, Turkey, Malaysia by different researchers shows that they also receive majority cases in pT2 stage followed by pT1 stage.Various studies have accepted that breast carcinoma spreads first through the axillary lymph node and the incidence of axillary lymph node involvement increases with larger tumors (Silverstein, Lee)[14]. According to tumor size we have divided the study population into main 3 groups (T1, T2 , T3). Our result demonstrates the strong relationship between primary tumor size and ALNI. As shown in table VI, T3 tumor size (more than 5 cm) had higher ALNI compared to other groups. Our result is comparable with others studies[13,15,16,17] and also confirmed by Chi-Square test to be statistically significant. In this study we have found an incidence of 16% tumors in pT1 stage with 33.33% overall incidence of ALNI of T1 tumors. Amrut. V. Ashthurkar et al.[14] reported pT1 tumors have (18 to 38.5)% chance of ALNM, whereasElahe Orang et al. [15]documented 15.30% incidence of Axillary lymph node metastasis in tumors less than or equal to 2 cm.

Conclusion

ALND for breast cancer generally is accepted for its staging & prognostic value. But the extent of dissection remains controversial. Moreover, ALND is associated with various complications like lymph edema, shoulder stiffness and pain.This cross sectional observational study was done on 150 carcinoma breast diagnosed patients who underwent simple mastectomy with ALND. According to histopathological study 66% of study population showed ALNM. In relation to size 1/3 of T1 tumors showed ALNM. Whereas 1/2 of T2 tumors and almost all T3 tumors involved axillary lymph node. So, incase of T1 tumors ALND will over treat almost two third population. So, there is still scope for research to identify the group of people with T1 tumors who can be speared from formal ALND. Here, SLNB and ALN sampling may prove itself as an acceptable alternativeof ALND for clinically node negative carcinoma breast.

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Case Report

Sudden cardiac Arrest During Spinal Anesthesia

Md. Abul Kalam Azad Khan [1] , Md. Nasir Uddin [2], Muhammad Akhtaruzzaman [3], Das Rickta [4], Sutlan Ahmed [5], Muhammad Kamruzzaman [6], Renaissance Happy Moon [7]

1. Assistant Professor & Head, Department of Anesthesiology , Community Based Medical College Bangladesh, Mymensingh
2. Assoc. Prof. and Head of the Department of Orthopaedic Surgery, CBMCB,
3. Junior Consultant, Upazila Health Complex, Shibchar, Madaripur,
4. Assistant Prof. Anaesthesiology Department, CBMCB,
5. Assistant Prof. Department of Medicine, CBMCB,
6. Asstt. Prof. Department of Paediatrics CBMCB,
7. IMO, OBG, CBMCHB.
** For Correspondence*

Abstract

Cardiac arrest during anesthesia and perioperative period is a matter of grave concern for any anesthesiologist. But such mishaps has been reported for one reason or the other in the literary sciences. We are reporting the occurrence of unanticipated delayed cardiac arrest following spinal anesthesia in two young and healthy patients. Fortunately, these patients were successfully resuscitate with timely and appropriate cardiopulmonary resuscitative measures. Occurrence of such cases needs timely reporting and exploring all the possible causes of the unusual and possibly avoidable events. The present case reports are an important addition to a series of recently published mishaps that occurred during spinal anesthesia in young and healthy patients.

Key Words : *Asystole, bradycardia, cardiac arrest, spinal anesthesia*

Introduction

Cardiac arrest during anesthesia and preoperative period is matter of grave concern for nay anesthesiologist. Occasionally, unexpected bradycardia and asystole may develop during the administration of spinal anesthesia in apparently healthy and young patients. Cardiac arrests during spinal anesthesia are described as "very ratre," unusual, "unusual," and "Unexpected" but are actually relatively common. In the literature, the reported incidence of cardiac arrest is 6.4±1.2 in 10,000 patients. We are reporting the occurrence of unanticipated delayed cardiac arrest following spinal anesthesia in two young and healthy patients.

Case Report : 1

The first case pertains to a 26 years-old female wt. 75 Kg. who was operated for fracture tibia, recently was posted for skin grafting because of extensive skin looss over the fractured site. All the preoperative X-ray chest posterior anterior view, and 12 lead electrocardiograms were normal. the patients was premeditated with tablet alprazolam 0.25mg a night before and in the morning 1 h prior to surgery which was planned under spinal anesthesia. In the operation theater (OT), routine monitoring included heart rate, electrocardiogram, noninvasive blood pressure (BP) and pulse oximetry, and baseline parameters were recorded which were normal. An intravenous (IV) access was secured with cannula and patients was preloaded with 10 ml of lactated Ringer's solution. Under all aseptic precautions subarachnoid block was performed at L3 L4 space in left lateral position with 25 gauge Quincke's needle and 3.2 mL of hyperbaric buypivacaine was injected into subarachnoid space after confirming clear and free flow of cerebrospinal fluid (CSF). Five minutes after turning the patients to supine position, sensory level was rechecked which was found to be at T10. During preparation of site for graft and almost 30 min after subarachnoid injection, patients started complaining of difficulty in breathing. Sensory level was rechecked which was found to be at T10. Bolus of injection atropine 0.6 mg was administered as his heart rate suddenly dropped to 38 beats/min, SpO2 to 72% while BP became unrecordable and peripheral pulses could not palpated .

Owing to diminishing consciousness, patient was immediately intubated with Bain's circduit and 100% oxygen was administered. Patients developed cardiac arrest and cardiopulmonary resuscitationi (CPR) was started immediately with pharmacolocial intervention with adrenaline, dopamine, and noradrenaline. Within 3 min, patient responded with a heart rate of 160bpm, SpO2-92%, and BP of 90/60 mm Hg but was restless. Patients remained restless even after administration of inj. Diazepam 10 mg, inj. Monnitol 100 ml given and inj. Phenytoin 1.5mg in IV infusion. Considering the poor response to resuscitative measures, patient was administered 150 mg propofol and was paralyzed with 6 mg vecuronium and electively ventilated in OT. Apart from sinus tachycardia, all investigations including serum electrolytes, arterial blood gas analysis (ABG-pH-7.414, PCO2-38, pO2-103), and chest X-ray were normal. After 4 h of elective ventilation and achievement of hemodynamic stability patient became conscious and started responding to verbal commands with good respiratory efforts and extubation was done after reversing the relaxant effect with standard doses of neostigmine and glycopyrrolate. Postextubation hemodynamic parameters were normal heart rate (RH) 114 bpm, BP 120/84 mm Hg, and SpO2-99%) and was transferred to intensive care unit (ICU) for further observation. Patient was discharged on 3rd day with uneventful course in ICU.

Case Report 2

The second case was an 18 years old male, wt. 60 kg, who was posted for right sided inguinal hernia. Preanesthetic and routine investigations were normal and patient was prescribed premedication with tablet alprazolam 7.5mg a night before and 1 h prior to surgery. Preoperative hemodynamic were recorded. In the OT, IV access was secured with 18 G cannula and preloading was done with 0.9% saline at 10 mL/Kg body weight over 20 min.

Intraoperative monitoring included HR, BP, electrocardiography (ECG), and SpO2. Subarachonoid block was administered under all aseptic conditions in L3-L4 interspaces with 25G Quincke's needle and 15 mg of 0.5% hyperbaric bupivacaine in left lateral position after confirming free and clear flow of CSF. Sensory blockade up to the level of T10 was attained. We waited for 10 min for complete establishment of neuraxial blockade. Before surgery could be started, just 15 min after the spinal block, patient suddenly developed convulsions with tight jaw and flexural rigidity of booth arms. Immediately, inj. Butorphanoal 1 mg was given intravenously and patient was ventilated with face mask and 100% O2 but patient developed sudden cardiac arrest during this short duration. Intubations was done with 7.5 cuffed ETT and ventilation initiated again with 100% O2. In the meantime, BP and peripheral pulses were unrecordabel and CPR started. Hear rate returned to 200/min after 1 min of administration of inj. Atropine 0.6mg and inj. Adrenaline 2 mg, but BP remained unrecordable. Infusion of dopamine and noradrenaline started at 10µg/kg/min. Patient developed ventricular tachycardia (VT) after 5 min and preservative free injection of 100 mg lignocaine was administered intravenously followed by DC shock of 200J as VT did not respond to pharmacological intervention. Rhythm reverted back to sinus rhythm with HR-190/min, BP-86/60 mm Hg, and SPO2-100% . Injection amiodarone 300 mg in 100 ml saline was given over 20 min and elective ventilation maintained with 100% O2. Intraoperative ABG and serum electrolytes were normal. After 2 h BP was 100/60 mm Hg with infusion of dopamine and noradrenaline at 5µg/kg/min, HR 140/min with regular rhythm and SpO2 of 100% was recorded. During this pried of elective ventilation, chest and cardio-vascular system (CVS) findings became normal. Patient had developed spontaneous respiratory efforts with good tidal volume and started obeying verbal commands. After achieving stable homodynamic parameters, patients was extubated and shifted to ICU for further monitoring and was discharged on 3rd day with an uneventful course.

Discussion

Spinal anesthesia is considered to be a safe procedure. This anesthetic technique can result in few complications among which the most dreaded though rare is cardiopulmonary arrest1. Although the

mechanism though which spinal anesthesia induces bvradycxardia or asystole is not completely known, it is established that the final pathway is the absolute or relative increase in activity of the parasympathetic nervous system5. Cardiac arrest has been reported within 12-72 min of spinal anesthesia, while cardiovascular side effects haven been reported as late as hours after the administration of spinal anesthesia6.

Sudden and unanticipated cardiac arrests have been reported in the literature1,2,43,4,5. The explanations and mechanisms related to these mishaps are, however, varied. The common physiological mechanisms probably related to the occurrence of these events are initiated by profound decrease in venous return. Reduction in right atrial pressure has been observed in 36% of the cases after low spinal levels and in 53% of cases with higher blockade levels2,5,6. The sudden decrease in preload initiates reflexes than can possibly cause severe bradycarida7 Higher neuraxial blockade resulting in hypoxia or hypercarbia can cause profound peripheral vasodilatation leading to significant decrease in venous return and poor atrial filling. The sympathetic blockade decreased venous return and hypotension resulting in cardiac arrest8,9. The physiological augmentation of these activities are result of blockade of T8-L1 fibers thus leading to decrease catecholamine secretion as a result of blockade of suprarenal glands which can produce refractory cardiac arrest10 In the present scenario, the level of sensory blockade was T10 in both the patients so possibility of this benign the cause in our cases seems less likely.

The other mechanisms involved in cardiac arrest after spinal anesthesia include administration of excessive does of local anesthetic in a previously hypovolemic patient which can be secondary to preoperative fasting, malnutrition, dehydration, use of diuretics or vasodilators. Even the preoperative evens such as bleeding , changes in patients positioning, placement of bone cement, light nature of anesthesia in the background of comobdidities and others can be responsible for cessation of cardiac activity. It is generally recommended that the level of blockade should be limited to T6 and homodynamic reserves should be evaluated and monitored for any complication. complication. The degree of bleeding should be observed regularly and replaced with blood whenever necessary, so as to reduce the morbidity and mortality11. The present case report pertains to young ASA grade I patients, who were preloaded with adequate fluid before administration of anesthesia. Then, the surgery did not start so all the above-mentioned cause do not seems to offer any plausible etiology.

Local anesthetics are widely used in modern medical procedures. Though the incidence of reported adverse effects of local anesthetics is low, occasional severe toxicity and deaths have been reported12. Among all, bupivacaine is considered to be 4-16 times more cardio-toxic than lignocaine13. delayed cardiac arrests have been reported after 20 min of spinal anesthesia12,13. This possibility cannot be ruled out comprehensively in the present scenario as one of he patient developed convulsions before cardiac arrest, while another patient had uneasiness and difficulty in breathing almost 20 min after administration of spinal anesthesia.

Circulatory or respiratory insufficiency can occur after inducing sedation for the purpose of giving comfort and relieving anxiety related to surgical procedure. The sedated state can result in loss of spontaneoug verbalization for a brief period of time before detection of cardiac arrest. Major hypoxic events ($SpO_2<85\%$ for >30s) have been presently but clinically unrecognized14. It has been suggested recently that the comnination of sympathetic blockade produced by high spinal anesthesia and vagolytic effect of fentanyl might account for the sudden apprerance of bradycardia15. Drugs such as droperidol can also lead to severe hypotension and sudden cardiac arrest during spinal anesthesia on account of their μ-blocking effect16. Patients on ? blockers and other alternatie medicines provide another challenging situations as the cardiac arrest in these patients can be refractory as vasoconstriction mechanisms in the peripheral vasculatrure may be imparied2,5,17. But in the present clinical situation, both the patients were neither receiving any ? blockers or other medications nor any sedation was administered before the occurrence of cardiac arrest.

The term "vagotonia" describes the clinical situation of resting bradycardia, AV block or complete AV dissociation that is normally present in 7% of the population18. In such population, incidence of a systole is higher during performance of procedures which can enhance vagolytic activity19,20. Cardiac arrest is more common in young individuals with an established fact that vagal tone is greater in these patients and increase in parasympathetic activity5,21 . This could be one of the possible causes in our patients. Sudden cardiac arrest has been reported after small postural changes of the patient including placing a leg in the holder and turning the patient to the left lateral or prone position and in some cases the arrest has been reported even after the surgical procedure had already finished22. It seems difficult to explain these situations based only on preload changes. May be, they are due to reflex phenomena similar to those of autonomic dysfunction or hyperreflexia described of the patient after spinal cord section. Thus, there should be minimal movement or mobilization of the patient after spinal anesthesia. However, in the present clinical scenario, patients had cardiac arrest in supine position which excludes the above-mentioned plausible cause.

The possibility of pulmonary embolism in the first case also does not seem to be a cause of cardiac arrest, because typical clinical presentation apart from shortness of breath such as chest pain, (pleuritic in nature) cough, and hemoptysis were absent. Moreover, intra-operative investigations such as ABG, ECG and CXR were also normal. Chest and CVS findings were also normal and no features suggestive of pulmonary edema were observed in either of the patients. Further, early recovery in our patients without any cardiac or central neurological sequelae does not favor the possibility of any pulmonary embolism episode.

Conclusion

The significant and management of such clinical situations depends upon anesthesiologist's activity and attitude while detecting that something is "going wrong". The experience-based empirical anesthesia practice should always consider evidence-based approach in such clinical situations23. The best clinical pearl in such situation is to believe and treat immediately what is happening in front of you. Disbelief and insecurity are common patterns of this situation and may influence the final outcome.

We wish to emphasize that a caution must be exercised when administering spinal anesthesia in high-risk patients. The knowledge of he physiological changes caused by spinal anesthesia and its complications, as well as adequate patients selection, respecting the contraindications of the procedure are extremely important. When a decision to use spinal anesthesia is made adequate monitoring and constant vigilance are of paramount importance. Epinephrine should be considered early in the treatment of sudden bradycardia, especially if conventional doses of atropine or ephedrine are not effective.

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