

The distribution of the patients according to the proportions of oral health literacy level is shown in the Table I. Among them, 7% had very poor OHLL, 51% had poor OHLL, 39% had fair and 3% had excellent oral health literacy level. Moreover, out of 32 male, 17% had fair, 13% had poor and 2% had excellent OHLL. What's more, out of 68 female, 38% had poor OHLL followed by 22% fair, 7% very poor and only 1% had excellent OHLL. In addition, a significant association found between patients' sex and oral health literacy level ( $P=0.008$ ).

**Table-I:** Distribution of the patients according to gender in relation to the proportions of oral health literacy level (n=100)

Oral health literacy level (OHLL)	Sex		Total	p-value <sup>a</sup>
	Male	Female		
Excellent	2	1	3	
Fair	17	22	39	
Poor	13	38	51	0.008*
Very poor	0	7	7	
Total	32	68	100	

<sup>a</sup> Pearson Chi-Square Test  
\* Statistically significant association ( $P<0.05$ )

The distribution of the patient according to diabetes mellitus in relation to oral health literacy level is shown in the Table II. Among the respondents, 74% had diabetes mellitus, and the rest 26% were absence of diabetes mellitus.

**Table-II:** Distribution of patients according to the history of Diabetes Mellitus (n=100)

Diabetes Mellitus	Frequency	Percent (%)
Yes	74	74.0
No	26	26.0
Total	100	100.0

Results were expressed as frequency (%)

The distribution of the patients according to oral health related behavior, in relation to in relation to oral health literacy level is shown in Table III. Here only 32% patients cleaned their teeth twice a day and

27% knew how to brush their teeth. Moreover, 58% of the patients visited to the dentist whereas 11% visited to dental technician or quack for their dental problem. Furthermore, 33% participants believed about myth in dentistry. Most of patients' common myths were "Extraction of upper teeth will affect vision" and "Charcoal, salt; rice husk and tobacco powder cleans better than toothpaste".

**Table-III:** Distribution of the patients according to oral health care related behavior, in relation to oral health literacy level (n=100)

Characteristics	Frequency	Percent (%)
<b>Clean teeth twice a day</b>		
No	68	68.0
Yes	32	32.0
<b>Know the technique of tooth brushing</b>		
No	73	73.0
Yes	27	27.0
<b>Visiting dentist for dental problem</b>		
No	42	42.0
Yes	58	58.0
<b>Visiting dental technician or quack for dental problem</b>		
No	89	89.0
Yes	11	11.0
<b>Believed about the myth in dentistry</b>		
No	67	67.0
Yes	33	33.0

The frequency of patients' socio-demographic characteristics in relation to oral health literacy level is provided in Table IV. Age range was 18 to 60 years. Middle aged people suffered more from dental problems. Mean age of the patients were  $37.01 \pm 10.457$  years. Among them females were common (68%). Muslim participants were high in number (95%). Most of the patients were married (72%). Education level was widespread with 11% had no formal education, 19% went to primary school, 17% had SSC level education, 26% HSC and 20% had more than HSC level education. 46% were housewives. 43% earns less than 5000 taka per month while 16% earns more than 15000 taka per month. Mean monthly income of the patients were  $5338.89 \pm 1358.813$  taka. Maximum (85%) were from rural area. Moreover, patients' sex, marital status and occupation were

significantly associated with oral health literacy level as the P-values were 0.008, 0.002 and 0.021 respectively. In addition, highly significant associations were found between patients' age, education, monthly income and oral health literacy level (P=0.000).

**Table-IV:** Distribution of the patients according to socio-demographic characteristics, in relation to oral health literacy level (n=100)

Characteristics	Frequency	Percent (%)	P-value <sup>a</sup>
<b>Age</b>	Mean = 37.01 ± 10.457		<b>0.000*</b>
18 - 29 Years	26	26.0	
30 - 39 Years	33	33.0	
40 - 49 Years	23	23.0	
50 - 60 Years	18	18.0	
<b>Sex</b>			<b>0.008*</b>
Male	32	32.0	
Female	68	68.0	
<b>Religion</b>			<b>0.526</b>
Muslim	95	95.0	
Hindu	5	5.0	
<b>Marital status</b>			<b>0.002*</b>
Single	18	18.0	
Married	72	72.0	
Widow	10	10.0	
<b>Education</b>			<b>0.000*</b>
Illiterate	11	11.0	
Primary	19	19.0	
Secondary	7	7.0	
SSC	17	17.0	
HSC	26	26.0	
Under Graduate or above	20	20.0	
<b>Occupation</b>			<b>0.021*</b>
Unemployed	12	12.0	
Service	23	23.0	
Farmer	4	4.0	
Day labour	2	2.0	
Business	12	12.0	
House wife	46	46.0	
Others	1	1.0	
<b>Monthly Income (Taka)</b>	Mean = 5338.89 ± 1358.813		<b>0.000*</b>
< 5000	43	43.0	
5001 - 10000	29	29.0	
10001 - 15000	12	12.0	
15000 >	16	16.0	
<b>Living area</b>			<b>0.432</b>
Rural	85	85.0	
Urban	15	15.0	

*a* Pearson Chi-square test

\*Statistically significant association (P < 0.05)

## Discussion

According to the 2003 National Adult Assessment of Literacy, about 22 % adults had only basic literacy skills, and as many as 14% of adults had below-basic abilities.<sup>9</sup> A short version of the Rapid Estimate of Adult Literacy in Dentistry-30 (REALD-30) was done where about 29% of the sample scored below 22 on the 30-point test, a score that defined as a low literacy level. Those with incorrect knowledge and fair-to-poor oral health status were more likely to have a low literacy level than were their reference groups.<sup>10</sup> The data in the present study showed that 7% had very poor OHLL, 51% had poor OHLL, 39% had fair and 3% had excellent oral health literacy level.

Diabetes mellitus affects all age groups, but is more common in adults. The World Health Organization (WHO) has recently declared it to be a pandemic. Various inflammatory diseases and soft tissue pathologies in oral cavities are associated with diabetes mellitus.<sup>11</sup> Some studies report limited health literacy is associated with poor glycemic control whereas others report limited health literacy is associated with poor disease knowledge and less adherence to diabetes self-care, but is not associated with glycemic control.<sup>12</sup> Present study showed that 74% had diabetes mellitus, and the rest 26% were absence of diabetes mellitus.

A study was done to evaluate tooth-brushing technique and oral hygiene knowledge in Rawalpindi population. The result showed that 87% brushed their teeth twice a day, only 4% knew proper technique and 43% were regular in their dental check up and follow up visits to their dentist. The overall awareness about oral hygiene knowledge was not satisfactory.<sup>13</sup> Present study showed that 32% cleaned their teeth twice a day, only 27% knew the technique of tooth brushing and 58% visited to their dentist for dental check up while 11% went to dental technician or quack for their dental problem.

Communities and countries with inappropriate exposure to oral health care delivery systems are at higher risk of oral diseases, when socio-cultural determinants such as poor living conditions; low education; lack of traditions, beliefs, culture & myths related to oral health are more prevalent.<sup>14</sup> In 2010, a descriptive cross-sectional study was conducted where 33% of the respondents believed

that extraction of tooth affects vision, whereas 62% believed that it is not true.<sup>15</sup> In another study, 24.47% believed that charcoal, salt, rice husk, tobacco, etc, in powder form is better than toothpaste in cleaning teeth.<sup>16</sup> The data of the present study showed that 67% participants believed about myth in dentistry and 33% did not believe about myths. Most of patients' believed common myths were "Extraction of upper teeth will affect vision" and "Charcoal, salt; rice husk and tobacco powder cleans better than toothpaste".

To measure oral health knowledge, a study was done among 100 low-income Baltimore adults that were categorized into three levels of knowledge (poor, fair, good). Nearly one-third of adults exhibited the lowest level. Comprehensive measures of oral health knowledge scores were significantly associated with age, education level, and annual household income.<sup>6</sup> In this study, highly significant associations were found between patients' age, education, monthly income and oral health literacy level ( $P=0.000$ ). In another analytic study, their mean age was 26.6 years ( $SD=6.9$ ). Two thirds of participants had a high school education or less, and less than one third rated their oral health as very good or excellent.<sup>17</sup> According to the data of the present study, the mean age of the patients were 37.01 years ( $SD=10.45$ ). About 17% had higher secondary school (HSC) education and only 3% rated their oral health literacy as excellent.

The average oral health literacy level of Iranian adults was low. Women ( $p < 0.001$ ), younger ( $p < 0.001$ ), and better educated participants ( $p < 0.001$ ) had higher OHL scores. Disseminating evidence-based oral health care information from multiple sources including TV/radio, dentists, and other health professionals in different settings should improve public oral health literacy.<sup>18</sup> In this study, patients' sex, marital status and occupation were significantly associated with oral health literacy level as the  $P$ -values were 0.008, 0.002 and 0.021 respectively.

### Limitations

This study would have needed a much larger sample size in order to generalize the results in Bangladeshi population. As there was limited time frame and resources to conduct the study, we used the most convenient formula for calculate the sample size. Therefore, the sample size became smaller which may decrease the statistical power.

Other limitation of this study was the veracity of the data collection by purposive sampling method using a semi-structured questionnaire. In this investigation the homogeneity of the sample could not be ensured. For instance, respondents from the sex groups were not equal in number. Again, socioeconomic backgrounds of the patients were varied, as the family income depends upon the number of persons employed.

Oral health related behavior mentioned in the questionnaire may differ from actual behavior, as the respondents have full authority to answer the questions as they liked and there was no system for cross check. The limitation of time, resources and facilities caused problems for an in-depth study particularly for the individual researcher.

### Conclusion

The current study showed that patients with inadequate oral health literacy were consistently more likely to report poor oral health than patients with adequate literacy skills. Association between oral health literacy and self-reported poor health should be interpreted cautiously. In addition, individual questions and oral health status scales need to be validated in low-literate patients to ensure that any differences in reported health do not merely result from differences in response styles between patients with low literacy and those with adequate education and knowledge. Thus, an extensive oral and dental health education is needed to raise knowledge and awareness so as to internalize the preventive oral and dental health practices into daily life style of the population. Future studies are needed to determine whether this framework is supported by empirical data and leads to improvements in oral health and reductions in health disparities.

**Conflict of interest :** We have no conflict of interest.

## References

1. Haridas R, Supreetha S, Ajagannanavar SL, et al. Oral health literacy and oral health status among adults attending dental college hospital in India. *Journal of International Oral Health* 2014; 6(6):61-66.
2. Khan AM, Ahmed SM. "Why do I have to clean teeth regularly?": Perceptions and state of oral and dental health in a low-income rural community in Bangladesh. BRAC research and evaluation 2011. RED working paper No. 20. [Internet] Available from: [http://www.bracresearch.org/workingpapers/red\\_wp20\\_new.pdf](http://www.bracresearch.org/workingpapers/red_wp20_new.pdf) [cited 2014 June 09]
3. The invisible barrier: literacy and its relationship with oral health. A report of a workgroup sponsored by the National Institute of Dental and Craniofacial Research, National Institute of Health, U.S. Public Health Service, Department of Health and Human Services. *J Public Health Dent* 2005, 65:174-182.
4. Horowitz AM, Kleinman DV. Oral health literacy: the new imperative to better oral health. *Dent Clin North Am* 2008; 52(2): 333-344.
5. Petersen PE, Bourgeois D, Ogawa H, Day SE, Ndiaye C. The global burden of oral diseases and risks to oral health. *Bull World Health Organ* 2005; 83(9):661-669.
6. Macek MD, Haynes D, Wells W, et al. Measuring conceptual health knowledge in the context of oral health literacy: preliminary results. *J Public Health Dent* 2010;70(3):197-204.
7. Nielsen-Bohlman L, Panzer A, Kindig DA, editors. Institute of Medicine of the National Academies. What is health literacy?; Committee on Health Literacy. *Health literacy: a prescription to end confusion*. Washington, DC: National Academy of Sciences; 2004.p. 31-58.
8. Khan SA, Dawani N, Bilal S. Perceptions and myths regarding oral health care amongst strata of low socio economic community in Karachi, Pakistan. *J Pak Med Assoc* 2012; 62(11): 1198-1203.
9. Kutner M, Greenberg E, Jin Y, Paulsen C. The health literacy of America's adults: Results from the 2003 national assessment of adult literacy (NCES 2006-483). U.S. Department of Education. Washington, DC: National center for education statistics; 2006.p.9-14.
10. Jones M, Lee JY, Rozier RG. Oral health literacy among adult patients seeking dental care. *The Journal of the American Dental Association* 2007; 138(9): 1199-1208.
11. AY, Al-Maskari MY, Al-Sudairy S. Oral manifestations and complications of diabetes mellitus. *Sultan Qaboos Univ Med J* 2011; 11(2): 179-186.
12. CY Osborn, SS Bains, LE Egede. Health literacy, diabetes self-care, and glycemic control in adults with type 2 diabetes. *Diabetes Technol Ther* 2010; 12(11): 913-919.
13. Bangash RY, Khan AU, Tariq KM, Rasheed D. Evaluation of tooth brushing technique and oral hygiene knowledge at AFID, Rawalpindi. *Pakistan Oral & Dental Journal* 2012; 32(1): 124-127.
14. Strategies and approaches in oral disease prevention and health promotion, WHO. [Internet] Available from : [http://www.who.int/oral\\_health/strategies/cont/en/](http://www.who.int/oral_health/strategies/cont/en/) [cited 2015 January 19]
15. Nasir Z, Ahmed W, Iqbal F, et al. Prevalence of social myths and taboos related to dental health among general population of Rawalpindi-Pakistan. *Pakistan Oral & Dental Journal* 2014; 34(3): 520-523.
16. Kumar S, Mythri H, Kashinath KR. A clinical perspective of myths about oral health: A hospital based survey. *Universal Journal of Pharmacy* 2014, 03(1): 35-37.
17. Lee JY, Divaris K, Baker AD, Rozier RG, Vann-Jr WF. The relationship of oral health literacy and self-efficacy with oral health status and dental neglect. *Am J Public Health*. 2012 May; 102(5): 923-929.
18. Sistani MM, Yazdani R, Virtanen J, Pakdaman A, Murtomaa H. Oral health literacy and information sources among adults in Tehran, Iran. *Community Dent Health* 2013; 30(3): 178-182.

## Isolation and Antimicrobial Susceptibility Pattern of Urinary Escherichia Coli in Dhaka Medical College Hospital, Bangladesh

\*TA Binte Islam<sup>1</sup>, SM Shamsuzzaman<sup>2</sup>, I Rahman<sup>3</sup>, F Ferdous<sup>4</sup>

<sup>1</sup>Dr. Tashmin Afroz Binte Islam, Assistant Professor of Microbiology, Tairunnessa Memorial Medical College, Gazipur, Bangladesh

<sup>2</sup>Prof. S M Shamsuzzaman, Professor of Microbiology, Dhaka Medical College, Dhaka, Bangladesh

<sup>3</sup>Dr. Irin Rahman, Assistant Professor of Microbiology, Ashiyan Medical College, Dhaka, Bangladesh

<sup>4</sup>Dr. Faria Ferdous Assistant Professor of Microbiology, Tairunnessa Memorial Medical College, Gazipur, Bangladesh

□

\*Corresponding Author

□□□□□□□□ Date of submission: 12 July 2015

Date of acceptance: 16 November 2015

### ABSTRACT

**Background:** Escherichia coli is the major bacterial pathogen being isolated and reported from urine, globally. For these uropathogens the therapeutic management becomes limited, so knowledge about the antimicrobial resistance pattern of these agents at a specific area may help the doctors to choose correct treatment regimen. The aim of the current study was to detect the common uropathogens from urine and the antimicrobial susceptibility pattern of Escherichia coli in Dhaka Medical College Hospital (DMCH).

**Methods:** Samples were collected over a period of 12 months from July 2011 to June 2012 from the patients of DMCH irrespective of age and sex. Samples were cultured in blood agar and MacConkey agar media and organisms were identified by different biochemical tests such as oxidase test, reaction in MIU and simmon's citrate media and different sugar fermentation tests. Data were analyzed using Microsoft Excel (2007).

**Results:** From total 300 urine samples, 177 (59%) Gram-positive and Gram-negative bacteria were isolated. Among them, Esch. coli was the most predominant 112 (63.28%) organism followed by Enterobacter spp. (11.87%). The prevalence of Esch. coli was significantly higher in females (63.39%) of younger age group than in males (36.61%). Esch. coli was highly sensitive to imipenem (100%) followed by ceftriaxone (62.50%), ceftazidime (55.36%) and azitromycin (35.72%) respectively. Low sensitivity patterns were found against doxycycline (13.39%), co-trimoxazole (16.07%), amoxiclav (21.43%) and ciprofloxacin (23.22%) respectively.

**Conclusion:** The result of this study provides insight into the high proportion of multidrug resistant Escherichia coli and creates a need to report them routinely in laboratories.

**Key Words:** Escherichia coli, urine

### Introduction

Antimicrobial resistance among bacterial strains is an emerging problem, worldwide. Urinary tract infections (UTIs) are one of the most common bacterial infections in humans both in the community and the hospital settings<sup>1-3</sup>. Escherichia coli are the pre-dominant pathogen commonly isolated in urine. These uropathogens have also developed resistance to commonly prescribed antimicrobial agents which severely limits the treatment options.

The prevalence of UTIs increases among patients from lower socio-economical group. UTIs including

catheter related bacteriuria constitute the most common nosocomial bacterial infection with an average rate of 13.1 cases per 1000 hospital discharges<sup>4</sup>. Due to this high prevalence UTIs warrant careful consideration by the clinicians. More than 90% of all uncomplicated UTIs are caused by Esch. coli infection<sup>5</sup>. Esch. coli causes a wide range of UTIs, including uncomplicated urethritis or cystitis, symptomatic cystitis, pyelonephritis, acute prostatitis, prostatic abscess, and urosepsis<sup>6</sup>.

An increasing antimicrobial resistance in Esch. coli

has been reported worldwide which is a crucial problem. The high consumption of often inappropriately prescribed broad spectrum antibiotics combined with overcrowding, multiple pathology and frequent use of invasive devices are the major factors contributing high level of resistance<sup>7</sup>. A continuous rise of resistance to different antimicrobial drugs complicates the treatment strategy of urinary tract infections. The prevalence and antimicrobial susceptibility profile of *Esch. coli* show considerable topographical differences as well as significant variations in different environments and populations<sup>8</sup>.

The present study has documented the distribution of urinary pathogens and multi drug resistance pattern of *Esch. coli* isolated from urinary tract infected patients in Dhaka Medical College Hospital.

## Materials and Methods

**Study design and population:** It was a cross-sectional study. Urine samples were collected from the patients who were earlier admitted in inpatient department or visited the outpatient department of Dhaka Medical College Hospital. Clean catch mid stream urine samples were collected in sterile containers. The patients comprised both sexes and all the age groups.

**Bacterial isolates:** A total of 300 urine samples were collected during July 1, 2011 to June 30, 2012 in the Department of Microbiology, Dhaka Medical College, Bangladesh. Approval was obtained from research review committee (RRC) and ethical review committee (ERC) of Dhaka Medical College according to declaration of Helsinki and national and institutional standards. Written consent was obtained from all participants.

**Isolation of gram-negative bacteria:** All the samples were inoculated on blood agar and MacConkey agar media and incubated at 37°C aerobically for 24 hours. The incubated plates were examined for bacterial growth and the organisms were identified by colony morphology, hemolytic criteria, staining character, pigment production and biochemical tests such as oxidase test, reaction in MIU and simmon's citrate media and different sugar fermentation tests<sup>9</sup>.

**Antimicrobial susceptibility testing:** Samples which showed significant colony count were taken into consideration and antimicrobial susceptibility pattern was determined by Kirby Bauer disk-diffusion method on Mueller-Hinton agar using commercially available antibiotic discs (Oxoid, Hampshire, UK) according to CLSI guidelines<sup>10</sup>. The antibiotic disk used in antibiogram for all the *Esch. coli* were co-trimoxazole (1.25/23.75 µg), gentamycin (10 µg), ciprofloxacin (5 µg), doxycycline (30 µg), azithromycin (30 µg), amoxiclav (20+10 µg), ceftriaxone (30 µg), ceftazidime (30 µg) and imipenem (10 µg). *Escherichia coli* ATCC 25922 was used for quality control.

## Data analysis

Data were analyzed using Microsoft Excel (2007).

## Results

Out of 300 mid stream urine samples 177 (59%) showed significant growth of bacteria from in patient department & out patient department (Table I).

**Table-I:** Rate of isolation of bacteria from urine sample (n=300)

Isolated bacteria	Frequency	Percentage
Significant growth	177	59.00
No growth	123	41.00
Total	300	100.00

*Esch. coli* was the most predominant (63.28%) Gram negative urinary pathogens followed by *Enterobacter* spp. (11.87%), *Acinetobacter baumannii* (5.65%) and *Klebsiella pneumoniae* (3.96%). Of the Gram positive bacteria, *Enterococci* (8.47%) was the predominant. Other Gram positive isolates were *Staphylococcus aureus* (1.69%) and *Staphylococcus saprophyticus* (1.13%) (Table II).

**Table-II:** Frequencies of microbial isolates from urine (n=177)

Species of bacteria	Number	Percentage
Esch. coli	112	63.28
Enterobacterspp.	21	11.87
Enterobacter aerogenes-19		
Enterobacter cbacae- 2		
Enterococci spp.	15	8.47
Acinetobacter baumannii	10	5.65
Klebsiella pneumoniae	7	3.96
Staphylococcus aureus	3	1.69
Pseudomonas aeruginosa	3	1.69
Proteus vulgaris	2	1.13
Citrobacter freundii	2	1.13
Staphylococcus saprophyticus	2	1.13

This study found that most (63.39%) Esch. coli associated UTI cases were in the age group of 21-40 years followed by 41-60 years (24.11%) with male and female distribution were 36.61% and 63.39% respectively (Table III).

**Table-III:** Age and sex distribution of Esch. coli culture positive cases (n=112)

Age group in years	Male n (%)	Female n (%)	Total n (%)
≤20	2 (1.78)	8 (7.14)	10 (8.92)
21 - 40	20 (17.86)	51 (45.53)	71 (63.39)
41 - 60	16 (14.29)	11 (9.82)	27 (24.11)
≥60	3 (2.68)	1 (0.90)	4 (3.58)
<b>Total</b>	<b>41 (36.61)</b>	<b>71 (63.39)</b>	<b>112 (100.00)</b>

*Esch. coli* had been shown highly sensitive (100%) to imipenem followed by ceftriaxone (62.50%), ceftazidime (55.36%) and azitromycin (35.72%) respectively. Low sensitivity patterns were shown against doxycycline (13.39%), co-trimoxazole (16.07%), amoxiclav (21.43%) and ciprofloxacin (23.22%) respectively (Table IV).

**Table-IV:** Antimicrobial susceptibility pattern of *Esch. coli* (n=112)

Antimicrobial Agents	Sensitive n (%)	Resistant n (%)
Imipenem	112 (100.00)	0 (0.00)
Azithromycin	40 (35.72)	72 (64.28)
Ciprofloxacin	26 (23.22)	86 (76.78)
Ceftriaxone	70 (62.50)	42 (37.50)
Gentamycin	33 (29.47)	79 (70.53)
Amoxiclav	24 (21.43)	88 (78.57)
Co - trimoxazole	18 (16.07)	94 (83.93)
Doxycycline	15 (13.39)	97 (86.61)
Ceftazidime	62 (55.36)	50 (44.64)

## Discussion

Urinary tract infection is one of the most common infectious diseases encountered in the medical practices and only second to respiratory tract infections as a cause of hospital visit<sup>11</sup>. *Esch. coli* is the leading cause of both community-acquired and nosocomial UTIs. The commonly prevailing factors like promiscuity, peer group influence, pregnancy, low socio-economic status]which are common among young men and women living in urban centers play a vital role in causing UTI<sup>12,13</sup>. It has been usually observed that UTI most commonly occurs in females and up to one-third of all women experience UTI at some point during their lifetimes<sup>14</sup>.

In this study, urine samples from 300 subjects were cultured of which 177 (59%) showed significant growth. This correlates with the findings of other studies<sup>15,16</sup>. Among the total 177 isolates, *Esch. coli* was the most predominant pathogen (63.28%) followed by *Enterobacter* spp. (11.87%), *Acinetobacter baumannii* (5.65%) and *Klebsiella pneumoniae* (3.96%). Of the Gram positive bacteria, *Enterococci* (8.47%) was the predominant followed by *Staphylococcus aureus* (1.69%) and *Staphylococcus saprophyticus* (1.13%) The predominance of *Esch. coli* associated UTI correlates with the findings of other studies<sup>16-18</sup>. The reason of the highest rate of isolation of *Esch. coli* is that they are the normal fecal flora and uropathogenic strains of *Esch. coli* have an adherence factor called fimbriae, or pili, which mediate the attachment to uroepithelial cells<sup>19</sup>.

In this study, UTI was found more in females (63.39%) than in males (36.61%). Maximum numbers of patients were found in age group 21-40 years. The findings are in agreement with the reports of other authors who found that 66%-71.1% cases were females and 28.9%-34% were males<sup>20,21</sup>. The high prevalence of infection in females is usually related to anatomical and pathogenic factors, eg, the short length of the urethra and hence lesser distance for bacteria to ascend up the tract, hormonal changes and short distance of urethra to anus<sup>22</sup>.

The antibiogram of isolated Esch. coli of the present study reveals that maximum resistance was found against doxycycline (86.61%) followed by cotrimoxazole (83.93%), amoxiclav (78.57%), ciprofloxacin (76.78%) respectively. 62.50% Esch. coli were sensitive to ceftriaxone. Imipenem was found to be 100% sensitive towards Esch. coli which correlates with the studies done by other authors<sup>16,23</sup>.

These increasing resistance patterns against commonly used antibiotics may be due to the fact that the antibiotic is being overprescribed, handed out to patients who have no bacterial infections<sup>24</sup>. The inappropriate usage of wide spectrum antibiotics, insufficient hygiene, immunosuppression, and a prolonged stay in the hospital are some other major etiological factors that elevate the chances of MDR infections<sup>25</sup>. The rapid emergence of antibiotic resistant strains such as ESBL, MBL producing strains alert us that we should be cautious with indiscriminate use of antibiotics as well as antibiotics should be prescribed with proper dose and duration after culture and sensitivity reports.

### Conclusion

The data presented in this study may help the clinicians in the rational choice of antibiotic therapy and to prevent misuse, or over use of antibiotics. The disc diffusion method which was used to assess sensitivity and resistance may also be correlated clinically but further investigations for assessing the minimum inhibitory concentrations method will be needed to obtain more reliable and better results.

### Acknowledgement

The authors gratefully acknowledge the technical support provided by Department of Microbiology, Dhaka Medical College.

**Conflict Of Interest :** Nothing to declare.

### References

1. Ullah F, Malik SA, Ahmed J: Antibiotic susceptibility pattern and ESBL prevalence in nosocomial Escherichia coli from urinary tract infections in Pakistan. *Afr J Biotechnol.* 2009; 8: 3921-3926.
2. Cox CE: Nosocomial urinary tract infections. *Urol.* 1988; 32: 210-215.
3. Gonzalez CM, Schaeffer AJ: Treatment of urinary tract infection: what's old, what's new, and what works. *World J Urol.* 1999; 17: 372-382.
4. Hooton TM, Bradley SF, Cardenas DD, Colgan R, Geerlings ES, et al. Diagnosis, prevention, and treatment of catheter associated urinary tract infection in adults: 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America. *Clin Infect Dis.* 2010; 50: 625-663.
5. Foxman B, Manning SD, Tallman P, Bauer R, Zhang L, Koopman JS, et al. Uropathogenic Escherichia coli are more likely than commensal E. coli to be shared between heterosexual sex partners. *Am J Epidemiol.* 2002; 156: 1133-1140.
6. Little P, Merriman R, Turner S, Rumsby K, Warner G, L owes JA, et al. Presentation, pattern, and natural course of severe symptoms, and role of antibiotics and antibiotic resistance among patients presenting with suspected uncomplicated urinary tract infection in primary care: observational study. *BMJ.* 2010; 340: 5633.
7. Kurin CM. Detection prevention management of urinary tract infections. 5th edition. Baltimore: Williams and Wilkins; 1997. p: 128-164.
8. Erb A, Stürmer T, Marre R, Brenner H. Prevalence of antibiotic resistance in Escherichia coli: overview of geographical, temporal, and methodological variations. *EJCMID.* 2007; 26: 83-90.
9. Baron EJ, Peterson LR, Finegold SM. Enterobacteriaceae. In: Forbes BA, Sahm DF, Weissfeld AS (eds). *Bailey and Scott's diagnostic microbiology.* 9th ed. St Louis: Mosby; 1994, p. 374-379.
10. Performance standards for antimicrobial susceptibility testing. Tenth informational supplement. National Committee for Clinical Laboratory Standards (NCCLS), 2000: M100-S10 (M2): 14-21.

11. Liperky BA. Urinary tract infection in men: epidemiology, pathophysiology, diagnosis & treatment. *Ann Intern Med.* 1989; 111: 138-50.
12. DoHS Annual Report of 2055/56, Department of Health Service HMG Nepal, 2000.
13. Kolawale AS, Kolawale OM, Kandaki-Olukemi YT, Babatunde SK, Durowade KA, Kplawale CF. Prevalence of urinary tract infections among patients attending Dalhatu Araf Specialist Hospital, Lafia, Nasarawa State, Nigeria. *Int J Med Medical Sci.* 2009; 1: 163-167.
14. Palac DM. Urinary tract infection in women. A physician's perspective, 1986. p. 17-25.
15. Kalsi J, Arya M, Wilson P, Mundy A. Hospital-acquired urinary tract infection. *Int J Clin Pract.* 2003; 57: 388-391.
16. Jhora ST, Paul S, Begum BA, Chowdhury AQ. AntibioGram of urinary Escherichia coli isolated in Sir Salimullah Medical College Mitford Hospital, Dhaka. *Bangladesh J Med Microbiol.* 2011; 5: 23-26.
17. Ahmed AA, Khatun M, Alam MJ. Antibacterial susceptibility of common aerobic bacteria of hospitalized patients. *Mymensingh Medical J.* 1995; 4: 256-260.
18. Das RN, Chandrashekar TS, Joshi HS, Gurung M, Shrestha N, Siivananda PG. Frequency & susceptibility profile of pathogens causing urinary tract infection in a tertiary care hospital in Western Nepal. *Singapore Med J.* 2006; 47: 281-284.
19. Johnson JR. Virulence factors in Escherichia coli urinary tract infection. *Clin Microbiol Rev.* 1991; 4: 80-128.
20. Parvin US, Hossain MA, Musa AK, Mahamud C, Islam MT, Haque N, et al. Pattern of aerobic bacteria with antimicrobial susceptibility causing community acquired urinary tract infection. *Mymensingh Medical J.* 2009; 18: 148-153.
21. Ahmed MU, Khairuzzaman M, Begum A, Ahmed I. Isolation and Antimicrobial Susceptibility Pattern of Escherichia coli Causing Urinary Tract Infection in Enam Medical College Hospital. *J Enam Med Col.* 2011; 1: 60-62.
22. Inabo HI, Obanibi HB. Antimicrobial susceptibility of some urinary tract clinical isolates to commonly used antibiotics. *Afr J Biotechnol.* 2006; 5: 487-489.
23. Shahnaz S, Murshed M, Rahman T. Urinary pathogens & its culture sensitivity pattern in Holy Family Red Crescent Medical College Hospital, Dhaka, Bangladesh. *Bangladesh Private Practitioners' Journal.* 2005; 11: 19-22.
24. Barnett BJ, Stephens DS. Urinary tract infection: an overview. *Am J Med Sci.* 1997; 314: 245-249.
25. Manjunath GN, Prakash R, Annam V, Shetty K. "The changing trends in the spectrum of the antimicrobial drug resistance pattern of uropathogens which were isolated from hospitals and community patients with urinary tract infections in Tumkur and Bangalore," *IJBMR.* 2011; 2: 504-550.

## Sleep Changes with Aging

\*AKMY Halim<sup>1</sup>

<sup>1</sup>*AKMY Halim, Vice Principal, Army Medical College, Bogra, Bangladesh*

\*Corresponding Author

*Date of submission: 24 November 2014 Date of acceptance: 03 March 2015*

### ABSTRACT

Sleep disorders and sleeping difficulty are poorly-addressed problems of aging. Research has shown that as many as 50% of older adults complain about difficulty in initiating or maintaining sleep. Elderly with varieties of sleep complaints are differentially affected by 'age-related cognitive decline'. Normal developmental processes have been affected with changes in sleep, which can be further compromised by sleep disturbances secondary to medical or psychiatric diseases such as chronic pain, depression, dementia or age-related primary sleep disorders (e.g., sleep disordered breathing and periodic limb movements during sleep), or certain combinations of these high-risk factors. Sleep serves as a protective mechanism to keep the organism out of danger; therefore, it is imperative to consider sleep disorders for quality life. The evaluation of these disorders is discussed in this review.

**Key Words:** Ageing, Sleep changes, Sleep-disordered breathing

### Introduction

Sleep problems appear to be widespread among the elderly<sup>1-2</sup>. Patients with sleeping difficulties report decreased quality of life and endorse more symptoms of depression and anxiety when compared to those without sleep difficulties. Evidence showed that inadequate sleep is associated with significant morbidity and mortality in older adults<sup>3</sup>. The prevalence of sleep-related breathing disorder (SRBD) and insomnia symptoms increases considerably with advancing age, but little is known about their co-occurrence and their effects<sup>4-6</sup>. They are at greater risk for decreased physical functioning, increased risk of work related accidents and problems with memory<sup>4</sup>.

Etiology is complex, involving multiple factors, such as neurodegenerative changes in the brain, the patient's environment, medical or psychiatric morbidity, and medications used to treat chronic illnesses<sup>2,7</sup>. Risk factors for sleeping difficulty in the elderly are depression, respiratory symptoms, disability, and fair to poor perceived health, and use of prescribed sedatives. The relationship between sleep disturbance and depression in the elderly is especially strong. Untreated insomnia may result in depression and the presence of a

depressed mood may even predict insomnia. It is difficult to determine whether depression causes insomnia or vice versa<sup>8-9</sup>, in a study of 7954 respondents by Ford and Kamerow suggests that unremitting insomnia causes depression<sup>10</sup>. This decreased ability to sleep is often as a function of co-morbidities associated with aging, rather than with aging per se<sup>11</sup>. A variety of age-related co-morbid conditions that exacerbate sleep disturbances such as ischemic heart disease, diabetes, depression, renal failure, arthritis, and pulmonary disorders and the multiple medications used to treat them are common in the older adult population and enhance risk for development of insomnia<sup>7,12-14</sup>. Narcotic analgesics routinely used to control chronic pain can cause excessive daytime sleepiness (EDS)<sup>15</sup>.

### Dementia

Dementia is a neurodegenerative disorders (e.g., Alzheimer's disease, Parkinson's disease). It affects memory, thinking, language, judgment, and behavior. Behavioral disturbances are exhibited in almost all people with dementia. Common behavioral disturbances are mood disorders (e.g., depression, apathy, euphoria); sleep disorders

(insomnia, hypersomnia, night-day reversal); psychotic symptoms (delusions and hallucinations); and agitation (e.g., pacing, wandering, sexual disinhibition, aggression). They are often persistent; greatly diminish quality of life of patients and their family caregivers<sup>16</sup>. Reports suggest that 19-44% of community-dwelling patients with dementia complain about sleep disturbances such as circadian rhythm changes, medical illnesses, depression and the primary sleep disorders<sup>17</sup>.

### Medical and Psychiatric Illnesses

Insomnia is difficulty in getting to sleep or staying asleep for long enough to feel refreshed on the next morning, even though he/she have had enough opportunity to sleep<sup>18</sup>. Studies showed that sleep disturbances in patients with chronic medical diseases such as arthritis, chronic pain, diabetes etc report difficulty in falling and/or staying asleep. Other health-related diseases those are associated with insomnia include congestive heart failure, cancer, nocturia, shortness of breath due to chronic obstructive pulmonary disease, neurological deficits related to cerebrovascular accidents, and Parkinson's disease<sup>7</sup>. Ohayon and Roth<sup>19</sup> conducted a large cross-sectional survey and observed that in 65% of those with major depression, 61% with panic disorder and 44% with generalized anxiety disorder also suffered from insomnia. Perlis et al.<sup>20</sup> also described that insomnia is a significant risk factor for recurrent and a new onset of major depressive disorder especially for the elderly subjects, particularly women, were at greater risk for the development of depression. The annual incidence rate of insomnia in 65 years or older is approximately 5%<sup>21</sup>.

While medications are traditionally used to treat insomnia, however, recent studies have shown that behavioral treatments are more effective and, thus, recommended as the first-line treatment option. Others treatment involves a combination of sleep restriction therapy, stimulus control therapy, relaxation techniques and good sleep hygiene practices<sup>22</sup>.

### Circadian Rhythm Changes

As people older, their circadian rhythms become weaker, desynchronized and lose amplitude.

Changes in the phasing of the circadian rhythm develop in older adults which can cause changes in the timing of the sleep period. The amplitude of the circadian rhythm decreases with age. In turn, this reduction can increase the frequency of nighttime awakenings and the severity of daytime sleepiness<sup>23</sup>. Nocturnal secretion of endogenous melatonin that also plays an important role in the sleep-wake cycle gradually decreases with age, possibly resulting in reduced sleep consolidation, duration and early morning awakenings<sup>23</sup>. Light exposure, social and activity rhythms has been demonstrated as the most powerful contributing to circadian entrainment in humans to the 24-h day<sup>24-25</sup>.

### Primary Sleep Disorders and Aging

Mental disorders, medical conditions, medications or substance use are not counted as the primary sleep disorders. The most common primary sleep disorder in the elderly population is: sleep-disordered breathing. Sleep-Disordered Breathing (SDB) describes a range of respiratory events that occur periodically during sleep, from simple snoring to complete cessation of airflow (apnea) at the more severe end. Snoring is the sound caused by the vibration of the uvula and soft palate due to obstructed air movement during breathing while sleeping. It plays a role in the breathing cessation during an apnea event and approximately 50 per cent of those who snore also have SDB<sup>26</sup>. The number of instances of apnea and hypopnea (partial reduction in airflow) per hour of sleep is called the Apnea-Hypopnea Index (AHI). For SDB diagnosis, a patient has an AHI > 5-10. Sleep-disordered breathing is more prevalent in the older population and even more common in elderly nursing home patients, especially among those who suffer from dementia<sup>27-30</sup>. Risk factors for SDB include: age, gender and obesity. Other conditions that increase the risk of developing SDB include: the use of sedating medications, alcohol consumption, family history, race, smoking and upper airway configuration. The main symptoms of SDB in the elderly population are snoring and EDS. The Sleep Heart Health Study found that the risk of developing cardiovascular disease, including coronary artery disease, congestive heart failure and stroke, is positively related to the severity of SDB<sup>31-33</sup>.

The most common and proven treatment for SDB is continuous positive airway pressure (CPAP). Patients with sleep apnea-hypopnea syndrome treated with CPAP have improved daytime function, alertness and quality of life<sup>34</sup>. Following CPAP treatment; older adults have increased neurobehavioral outcomes in cognitive function, memory and have more consolidated sleep. Moreover, a positive effect for CPAP user observed on the factors affecting the cardiac functions included vascular resistance, platelet coagulability and other aspects of cardiovascular health. Therefore, the SDB treatment needs to be considered as an important and urgent regardless of the age<sup>35-36</sup>.

Other important primary sleep disorders are restless legs syndrome/periodic limb movements in sleep (RLS/PLMS) and Rapid Eye Movement Sleep-Behavior Disorder (RBD).

### Restless Legs Syndrome/Periodic Limb Movements in Sleep

Restless Legs Syndrome (RLS) is an uncomfortable sensation in legs accompanied by urge to move that occurs in a relaxed awake or restful state and, thus, is more common during the evening or at night. Movement provides temporary relief of this uncomfortable sensation. Other terms that are used to describe this sensation include: creepy-crawly, electric current, crazy legs, worms moving, ants crawling or pain<sup>37</sup>. The development of secondary RLS is associated with renal failure, iron deficiency, frequent blood donation, Parkinson disease, neuropathy, as well as pregnancy. Generally, these medical conditions are more frequently complicated in patient with RLS than in healthy controls<sup>38</sup>.

Periodic Limb Movements in Sleep (PLMS) are characterized by clusters of repetitive leg jerks or kicks causing brief arousal and/or awakening occurring approximately every 20-40 sec over the course of a night during sleep. PLMS is diagnosed with an overnight sleep recording (polysomnogram) which shows patients having at least 5 leg jerks per hour of sleep associated with arousal. It is often related to RLS and in the absence of RLS; there may be little clinical significance to PLMS. The prevalence of both RLS and PLMS increases significantly with age<sup>39</sup>. The recommended treatments for RLS/PLMS are dopamine agonists for all age groups<sup>40</sup>.

### Rapid Eye Movement Sleep-Behavior Disorder (RBD)

RBD is a condition in which the skeletal muscle atonia normally found in Rapid Eye Movement (REM) sleep is absent. The patient's uncontrolled movements like kicking, punching, running and/or yelling are found in sleep and sometimes it can be aggressive and/or violent, and might result in injuries either to the patient himself and/or the patient's bed partner. The etiology of chronic RBD is currently unknown; some data suggest that RBD may be the first manifestation and/or indication of a neurodegenerative disease<sup>41</sup>. Study showed that 50% of those diagnosed with RBD has developed Parkinson's disease or Multiple System Atrophy within 3-4 years<sup>42</sup>.

Among the common problems related to aging is sleep quality. Sleep disturbances that are frequently seen in people with neurologic disorders place significant stress on the functional status, changes in cognition and mood, and behavioral disruptions. In addition, sleep-disordered breathing is a common manifestation higher in older compared to middle-aged adults resulting in an increased burden for families and caregivers associated with increases in overall health care costs. Careful health assessment in an individual with sleep disorders can improve the overall sleep problems for elderly in this population.

**Table I: Some Wake-Promoting Agents<sup>43</sup>**

MEDICATION	DOSE (MG)	COMMON SIDE EFFECTS	SERIOUS SIDE EFFECTS	CONTRA INDICATIONS AND PRECAUTIONS
Amphetamine/dextroamphetamine IR (Adderall)	5-60	Weight loss, headache, insomnia, tremor, abdominal pain, anorexia,	Cardiomyopathy, chest pain, MI, irregular heart rate, immune hypersensitivity reaction, CVA, CNS stimulation, psychotic disorder with prolonged use, sudden death,	Advanced arteriosclerosis, hyperthyroidism, severe hypertension
Dextroamphetamine SR	5-60	xerostomia, euphoria, nervous, restlessness	Hypertension (frequent), tachyarrhythmia (frequent), thrombocytopenia, hallucinations	H/O drug dependence or alcoholism. Pts taking MAOIs and pts with glaucoma, motor tics, Tourette's syndrome
Methylphenidate hydrochloride (Ritalin, Concerta)	10-60	Loss of appetite, abnormal behavior, restlessness	Hypersensitivity syndrome, Stevens-Johnson syndrome, hypertension	Angioedema, hypersensitivity, anaphylactoid reaction
Modafinil (Provigil)	200-800	Headache, nausea, anxiety nervousness, insomnia, dizziness	Hypersensitivity syndrome, Stevens-Johnson syndrome, hypertension	Angioedema, hypersensitivity, anaphylactoid reaction

avg, average; CNS, central nervous system; CVA, cerebrovascular accident; MAO, monoamine oxidase; MAOI, monoamine oxidase inhibitor; MI, myocardial infarction;

**Talbe II:** Some Hypnotic Drugs Used in the Treatment of Insomnia<sup>44</sup>

DRUG TYPE	MEDICATION	DOSE (MG)	SIDE EFFECTS	CONTRA INDICATIONS AND PRECAUTIONS
Benzodiazepine Hypnotics	Nitrazepam (Alodorm)	5-10	Drowsiness, dizziness, visual disturbance, hypersensitivity reactions, GI disturbance, urinary retention, dependency.	Acute pulmonary insufficiency, respiratory depression, chronic psychosis
	Temazepam (Restoril)	15-30		
Nonbenzodiazepine Hypnotics	Zolpidem (Ambien)	5-10 (age >65 yrs)	Daytime drowsiness, dizziness, vertigo, nightmare, confusion, tremor, unsteady gait.	History of drug or alcohol use, tolerance, amnesia, psychiatric reactions.
	Zopiclone (Imovane)	3.75 (age >65 yrs)		
Nonhypnotics Sometimes Used to Aid Sleep	Clonazepam (Klonopin)	0.5-3	Muscle hypotonia, coordination disturbances, mental change.	Respiratory depression, Acute pulmonary insufficiency
	Diazepam (Valium)	2-10		

**Table III:** Other Drugs Used to Treat Insomnia<sup>44</sup>

Drug	Drug Type	Dose (Mg)	Side Effects	Contra Indications and Precautions
Melatonin	Hormone	3 -6	Headach, depression	Autoimmune diseases
Diphenhydramine	Ethanolamine antihistamine	50 -75	Drowsiness, dryness of mouth & skin	Alcohol & other CNS depressants
Gabapentin	Anticonvulsant	900	Fatigue, weight gain, ataxia	Known hypersensitivity drug

**Conflict of interest:** absent

## References

1. Roepke SK, Ancoli-Israel S. Sleep disorders in the elderly. *Indian J Med Res* 2010; 131: 302-10.
2. Harrington JJ, Lee-Chiong T Jr. Sleep and older patients. *Clin Chest Med* 2007; 28(4): 673-84.
3. Rockwood K, Davis HS, Merry HR, MacKnight C, McDowell I. Sleep disturbances and mortality: results from the Canadian Study of Health and Aging. *J Am Geriatr Soc* 2001; 49(5): 639-41.
4. Gooneratne NS, Gehrman PR, Nkwuo JE, Bellamy SL, Schutte-Rodin S, Dinges DF, et al. Consequences of comorbid insomnia symptoms and sleep-related breathing disorder in elderly subjects. *Arch Intern Med* 2006; 166(16): 1732-8.
5. Martin J, Stepnowsky C, Ancoli-Israel S: Sleep apnea in the elderly; In: McNicholas WT, Phillipson EA (eds): *Breathing Disorders During Sleep*. London, W.B. Saunders Company Ltd, 2002, pp 278-87.
6. Gülbay BE, Acican T, Onen ZP, Yildiz OA, Bağcıoğlu A, Arslan F, et al. Health-related quality of life in patients with sleep-related breathing disorders: relationship with nocturnal parameters, daytime symptoms and co-morbid diseases. *Respiration* 2008; 75(4): 393-401.

7. Foley D, Ancoli-Israel S, Britz P, Walsh J. Sleep disturbances and chronic disease in older adults: results of the 2003 National Sleep Foundation Sleep in America Survey. *J Psychosom Res* 2004; 56: 497-502.
8. Cole MG, Dendukuri N: Risk factors for depression among elderly community subjects: a systematic review and meta-analysis. *Am J Psychiatry* 2003; 160: 1147-56.
9. Chen YS. Association between chronic insomnia and depression in elderly adults. *J Chin Med Assoc* 2012; 75(5): 195-6
10. Ford DE, Kamerow DB. Epidemiologic study of sleep disturbances and psychiatric disorders. An opportunity for prevention? *J Am Med Assoc* 1989: 1479-84.
11. Neikrug AB, Ancoli-Israel S. Sleep disorders in the older adult - a mini-review. *Gerontology* 2010; 56(2): 181-9.
12. Jang Y, Shin J, Cho S, Kim G, Chiriboga DA. The interactive role of chronic medical conditions and sleep disturbance in predicting depressive symptoms among Korean American older adults. *Aging Ment Health*. 2011; 15(2): 198-203.
13. Vitiello MV, MoeKE, Prinz PN. Sleep complaints cosegregate with illness in older adults: clinical research informed by and informing epidemiological studies of sleep. *J Psychosom Res* 2002; 53(1): 555-9.
14. Martin J, Shochat T, Ancoli-Israel S. Assessment and treatment of sleep disturbances in older adults. *Clin Psychol Rev* 2000; 20(6): 783-805.
15. Koehler U, Augsten M, Cassel W, Jerrentrup A, Nolte J, Dette F. Sleep-disordered breathing in long-term opioid therapy. *Dtsch Med Wochenschr* 2010; 135(22): 1125-28.
16. Desai AK, Schwartz L, Grossberg GT. Behavioral Disturbance in Dementia. *Curr Psychiatry Rep* 2012 May 27. [PMID 22644311]
17. McCurry SM, Reynolds CF, Ancoli-Israel S, Teri L, Vitiello MV: Treatment of sleep disturbances in Alzheimer's disease. *Sleep Med Rev* 2000; 4: 603-28.
18. American Academy of Sleep Medicine. *The International Classification of Sleep Disorders*. 2nd ed. Westchester (IL): The Academy; 2005.
19. Ohayon MM, Roth T: What are the contributing factors for insomnia in the general population? *J Psychosomatic Res* 2001; 51: 745-55.
20. Perlis ML, Smith LJ, Lyness JM, Matterson SR, Pigeon WR, Jungquist CR, et al. Insomnia as a risk factor for onset of depression in the elderly *Behav. Sleep Med* 2006; 4(2): 104-13.
21. Foley DJ, Monjan A, Simonsick EM, et al. Incidence and remission of insomnia among elderly adults: an epidemiologic study of 6,800 persons over 3 years. *Sleep* 22 (Suppl 2)1999; S366-72.

22. Morin CM, Colecchi C, Stone J, Sood R, Brink D: Behavioral and pharmacological therapies for late life insomnia. *JAMA* 1999; 281: 991-9.
23. Brown SA, Schmitt K, Eckert A. Aging and circadian disruption: causes and effects. *Aging (Albany NY)* 2011; 3(8): 813-7.
24. Duffy JF, Kronauer RE, Czeisler CA. Phase-shifting human circadian rhythms: influence of sleep timing, social contact and light exposure. *J Physiol (Lond)* 1996; 495(Pt 1): 289-97.
25. Mistlberger RE, Skene DJ. Social influences on mammalian circadian rhythms: animal and human studies. *Biol Rev Camb Philos Soc* 2004; 79: 533-56.
26. Collop NA, Cassell DK. Snoring and sleep-disordered breathing. In: Lee-Chiong TL, Sateia MJ, Carskadon MA, editors. *Sleep Medicine*. Philadelphia: Hanley & Belfus; 2002. P.349-55.
27. Crowley K. Sleep and sleep disorders in older adults. *Neuropsychol Rev*. 2011; 21(1): 41-53.
28. Ancoli-Israel S, Gehrman P, Kripke DF, Stepnowsky C, Mason W, Cohen-Zion M, Marler M: Long-term follow-up of sleep disordered breathing in older adults. *Sleep Med* 2001; 2: 511-6.
29. Young T, Shahar E, Nieto FJ, Redline S, Newman AB, Gottlieb DJ, et al: Predictors of sleep-disordered breathing in community-dwelling adults: the Sleep Heart Health Study. *Arch Intern Med* 2002; 162: 893-900.
30. Young T, Palta M, Dempsey J, Skatrud J, Weber S, Badr S: The occurrence of sleep disordered breathing among middle-aged adults. *N Engl J Med* 1993; 328: 1230-35.
31. Launois SH, Pepin JL, Levy P: Sleep apnea in the elderly: a specific entity? *Sleep Med Rev* 2007; 11: 87-97.
32. Shahar E, Whitney CW, Redline S, Lee ET, Newman AB, Javier NF, et al: Sleep-disordered breathing and cardiovascular disease: cross sectional results of the Sleep Heart Health Study. *Am J Respir Crit Care Med* 2001; 163: 19-25.
33. Bassetti CL, Milanova M, Gugger M: Sleep-disordered breathing and acute ischemic stroke: diagnosis, risk factors, treatment, evolution, and long-term clinical outcome. *Stroke* 2006; 37: 967-72.
34. McArdle N, Douglas NJ. Effect of continuous positive airway pressure on sleep architecture in the sleep apnea-hypopnea syndrome: a randomized controlled trial. *Am J Respir Crit Care Med* 2001; 164: 1459-63.
35. Ayalon L, Ancoli-Israel S, Stepnowsky C, Palmer BW, Liu L, Loreda JS, et al: Adherence to continuous positive airway pressure treatment in patients with Alzheimer's disease and obstructive sleep apnea. *Am J Geriatr Psychiatry* 2006; 14: 176-80.
36. Weaver TE, Chasens ER: Continuous positive airway pressure treatment for sleep apnea in older adults. *Sleep Med Rev* 2007; 11: 99-111.
37. Allen RP, Picchiatti DL, Hening WA, Trenkwalder C, Walters AS, Montplaisi J, Restless Legs Syndrome Diagnosis and Epidemiology workshop at the National Institutes of Health, International Restless Legs Syndrome Study Group: Restless legs syndrome: diagnostic criteria, special considerations, and epidemiology. A report from the restless legs syndrome diagnosis and epidemiology workshop at the National Institutes of Health. *Sleep Med* 2003; 4: 101-19.
38. Nomura T, Nakashima K. Prevalence of restless legs syndrome. *Brain Nerve* 2009; 61(5): 515-21.
39. Hornyak M, Feige B, Riemann D, Voderholzer U. Periodic leg movements in sleep and periodic limb movement disorder: prevalence, clinical significance and treatment. *Sleep Med Rev* 2006 Jun; 10(3): 169-77.
40. Hening W, Allen RP, Picchiatti DL, Silber MH, Restless Legs Syndrome Task Force of the Standards of Practice Committee of the American Academy of Sleep Medicine: An update on the dopaminergic treatment of restless legs syndrome and periodic limb movement disorder. *Sleep* 2004; 27: 560-83.
41. Boeve BF, Silber MH, Ferman TJ, Lucas JA, Parisi JE: Association of REM sleep behavior disorder and neurodegenerative disease may reflect an underlying synucleinopathy. *Mov Disorders* 2001; 16: 622-30.
42. Olson EJ, Boeve BF, Silber MH: Rapid eye movement sleep behaviour disorder: demographic, clinical and laboratory findings in 93 cases. *Brain* 2000; 123: 331-9.
43. Mendenson W. Hypnotic medications: Mechanism of action and pharmacologic effects. In: Kryger MH, Roth T, Dement WC, editors. *Principles and Practice of Sleep Medicine*. Missouri: USA; 2011. pp. 484.
44. Nishino S and Mignot E. Wake-promoting medications: Efficacy and adverse effects.. In: Kryger MH, Roth T, Dement WC, editors. *Principles and Practice of Sleep Medicine*. Missouri: USA; 2011. pp. 532.

## An Overview of Reports on Clinical Case Report

\*MAW Khan<sup>1</sup>, AS Arif<sup>2</sup>

<sup>1</sup>Prof. Dr Md Abdul Wohab Khan, Professor, Department of Surgery, AKMMC  
<sup>2</sup>Prof. Dr Abdus Salam Arif, Professor & Head, Department of surgery, AKMMC

\*Corresponding Author

Date of submission: 22 February 2015      Date of submission: 7 November 2015

### ABSTRACT

Case reports represent the oldest and most familiar form of medical communication. It is one of the best ways for the beginners to get familiar with scholarly writing. It is the time-honored vehicle for medical teaching. It is also the foundational 'building block' of scientific inquiry. Unfortunately from late 1970s in scientific community there was a tendency to see the case report as least important and a 'second class' publication. The authors tried to find out how this 'fertile seeds' were cultivated and valued by the scientific community. Articles on case reports were collected consecutively by daisy chaining from web and published journals. Many logical arguments are found in favor of encouraging in writing and publishing case reports. There are also issues to be addressed further. Diversified criteria and styles can be followed. Uniqueness is not the only principle, any information which someone find useful and beneficial in clinical practice can be presented as case report. Facts in a case report can be considered as one of the weakest evidence and should not be considered as anecdotal information. To make others aware of unusual presentations or complications; case report is the rapid and effective means of communication.

**Key Words:** Case report, evidence based practice

### Introduction

Case reports represent the oldest and most familiar form of medical communication<sup>1</sup>. Case descriptions suggestive of cancers were found in papyrus records in Egypt; as early as 1600 BC<sup>2</sup>. Even before Hippocrates case reports have provided a rich resource for teaching and research in medicine<sup>3</sup>. Sir William Osler encouraged others to record and publish whenever they have made or recorded unusual or original observation<sup>4</sup>. It is one of the best ways for beginners to get familiar with scholarly writing<sup>5</sup>. A case report may not have as much potential impact on the science or practice of health care as randomized controlled trial or other research results. However, it may be the only way to make others in the field aware of unusual presentations or complications. Most importantly it is the time-honored vehicle for teaching others. New syndromes, manifestations, associations, complications, or outcomes are appropriate subjects for case reports, as are typical well-documented examples of known entities that are relevant to a journal's readers<sup>6</sup>.

Case reports are the foundational 'building blocks' of scientific inquiry<sup>7</sup>. Many original observations were first presented as case reports. The discovery of AIDS was founded on the basis of a case report on extensively disseminated Kaposi's sarcoma in a young homosexual man published in the American Journal of Dermato-pathology in 1981<sup>3</sup>. Unfortunately from late 1970s in scientific community there was a tendency to see the case report as least important and a 'second class' publication<sup>1,8</sup>. In Bangladesh and probably most of the peer reviewed journal all over the world; case reports are published in a separate section, not in the 'original article' sections. The authors tried to find out why a case report was not valued as an original publication or an important source of information in scientific progress. How they are valued in the scientific community was also an inspiring quarry. This article probably will help to focus on the way to answer the questions.

## Methods

The case report and the articles on case reports were retrieved from web. The articles on case reports in the published journals in different libraries of medical institutes were also reviewed. The case reports and articles written on case reports were selected consecutively. Articles were collected by daisy chaining. Data synthesized and informations were collected and recorded on a predesigned data collection form and checklist. These were developed on the basis of reviewer's checklist for case report of few national and international peer reviewed journals. Suggestions from critical appraisal checklist used in the journal club of different institutes were also taken into account. Some statistical and research methodology text books were also consulted<sup>9-11</sup>.

## Results and discussion

### *Definitions and Terminologies*

A case may be defined as a happening, an event or an occurrence<sup>12</sup>. A medical case report is 'an article that scientifically describes and interprets an individual case or few cases often written in the form of a detailed story of illness, including the presenting signs and symptoms, diagnostic studies, treatment course and outcome<sup>6,8,13,14</sup>. Sir William Osler described case reports as a 'scientific observations; carefully documented so that they may be a valuable education and research resource<sup>4</sup>. Usually most of the report consists of a single report often termed as 'clinical case report', 'a medical case report', 'a single patient case report', 'case report', 'clinical story' and 'a single case report'. If more than one, it may be called 'case series', 'case series report', 'time series case report<sup>6,15-17</sup>.

### **Case Report and Case Series**

There is no consensus on defining the demarcation between case report and case series. Case report is the detailed description of case(s) and case series is the cumulative group result of a number of cases<sup>18,19</sup>. Both are descriptive and observational research design but case report is much towards qualitative and case series is more to describe the findings quantitatively<sup>20</sup>. There is no agreed minimum or maximum number; some accept at least three as case series<sup>21</sup> and others accept ten or less in case

report<sup>15</sup>. In a study on case report taken from several prestigious journals, Abu-Zidan et al<sup>18</sup> reported that more than 52% case reports have case number less than 5 on the other hand 63% of case series had case number 10 or less with a median number of seven per series.

### *Case Report and Study Design*

Case report is a descriptive study design with 'in depth and naturalistic' analysis. In that sense it has got similarities with qualitative research. In general a case report is retrospective as it is not a part of planned or predesigned research project<sup>6,17,22</sup>. It can be experimental and prospective when the author plan the patient care ahead of time, as it was done in ligating PDA on a patient in 1939<sup>23</sup> and in doing a parathyroid adenectomy using endoscopic technique in BSMMU in 2007<sup>24</sup>; it is then called 'a case study'<sup>8</sup>. 'Time series case report' is one of the prospective designs as used by some to generate a hypothesis where the clinician takes data several times before and after the intervention<sup>25</sup>. One of the time series design is 'AB case report' where at least three measurements is taken to avoid inaccurate measurement both before (phase A) and during the care (phase B)<sup>26,27</sup>.

### *Place of Case Report in Publication*

The number of case report and its acceptance as publication is increasing. Sorinola et al<sup>28</sup> found about 240,000 case report on Medline between 1997 and 2002. In another review it was shown that case report constitute about 7% of medical journal publication of which 2% were published as original article. It was also noted that most (72%) of the single case report was published by the specialists<sup>29</sup>. Case report is considered as the most popular form of medical communication. In a study it was shown that 19% to 35% of patients presenting to GP with unexplained symptoms and apprehending that something is missing. A case report may highlight a new way to explain those symptoms<sup>30</sup>. Many original observations were detected first and reported as case report. So it should not be ignored or appreciated as a second class publication<sup>1</sup>. Many peer reviewed journal have a 'Case report' section. Various formats are used, such as 'Clinical case conference', 'technical report', 'letter to the editor' 'lesson of the month'

and 'Evidence based case report'<sup>8,31</sup>. There are also Journals to publish case reports as 'core publications'<sup>32</sup>.

### *Case Reports as Citation*

Usually case report has got a low citation value. It is not frequently cited and is 'less often quoted' than other type of articles. Its publication tends to be declining in journals with high impact. It is considered that these are written by less experienced younger clinician. Although seem less important but the close and regular involvement of the younger clinician than their seniors can be a great environment for good case studies<sup>8,33,34</sup>.

### *Case Report and Evidencebased Medicine*

Traditionally case report is considered as anecdotal information due to its small sample size. Still it is an 'amusing and interesting' account of a particular incident or event<sup>35-37</sup>. Important and detailed information of a single incidence for clinical practice may be missed or beyond the scope of larger studies but can be discussed in case report<sup>34,38</sup>. Case report can help and guide in clinical decision making process<sup>39</sup>. The experiences on a case should not change the way of an established management of any diseases but should create a desire to rethink on it<sup>17,40-45</sup>. The controversy of scientific value of a case report has been diminishing and the demand and importance of its publication increasing from the late 1990s<sup>8,32</sup>. Pearson<sup>46</sup> summarized the reports from literatures; to rank the articles as evidences. Case report was not in the list in most of the hierarchy schemes. Those who considered case report as evidence; it was placed at the lowest step of the ladder<sup>48</sup>.

Report on cases was the only basis of clinical medicine for many centuries and they can still contribute to our knowledge and understanding<sup>49,50</sup>. Case report for alerting the practitioners to possible new reactions is one of the vital safety points for the treatment process. The case report serves to describe the basic needs of medical science for its real progress<sup>8</sup>. Many scientific communities are considering that the case report is not anecdotal information. It may be the 'weakest' but first line of evidences in health care<sup>2,6,17,33,51</sup>.

### *Medical Education and Case Report*

Medicine is the subject which should be learnt in workplace. Case report has been used for many years as an important means for educating students. Case reports provide a rich resource for teaching and research in medicine<sup>3,47,52</sup>. 'A case report, if prepared properly, is a valuable educational device to describe clinical syndrome, association, reaction, or treatment. If a report advances basic understanding of a disorder, increases clinical skill, or suggests useful research, it is worthy'<sup>53</sup>. Case based educational articles published in many journals from ground round presentations, case of the month and clinicopathological conferences are one of the important approaches for educating the medical practitioners<sup>17,40-46</sup>. Case report is valuable when it describes unusual or unique conditions and presents an event that is new or clinically educational<sup>33,54</sup>. It is a useful resource to highlight on key learning points for the practitioners on rare conditions<sup>39</sup>. A case report is more valuable in learning benefit and risks on newly emerging or traditional (acupuncture) therapeutic speciality<sup>49</sup>.

### *Reasons to Publish a Case Report*

A case report can be the source of new knowledge if it describes previously unknown syndrome or disease, unreported association of two distinct diseases, a previously unreported observation in a known case or an unusual or exceptional pattern of presentation of a known disease and a previously unrecognized therapeutic adverse or beneficial effect of an intervention<sup>5,7,38,51,55,56</sup>. New observation or explanation of a finding to elucidate the mechanism of disease or to offer a new insight on pathogenesis or a challenging differential diagnosis can be important attraction of reporting a case<sup>47,57</sup>. Clinically important hazards or potential problems associated with the use of diagnostic or therapeutic devices or materials, mistake in diagnosis and causes and consequences of those can be a matter of discussion in a case report<sup>58</sup>. To demonstrate a manifestation, finding or feature more clearly with a new technology or technique can be described in a case report<sup>59</sup>. To illustrate, support or to point out a new hypothesis can be a theme for reporting a case<sup>47</sup>. Care in an unusual clinical setting can be described in the form of a case report<sup>17</sup>. The

'typical or classical' case can be reported to summarize and synthesize existing knowledge for educational purposes<sup>33,47,51</sup>.

#### *Case Report as a Foundation of Research*

For a rare and new clinical event case report is the main and principal means of surveillance<sup>31</sup>. Report on cases can provide a data or information to generate questions in the clinician's mind<sup>8</sup>. Despite the limitation of case reports, these are useful to generate new hypothesis for future large scale clinical trials<sup>17,40-46</sup>. It is considered as the foundation of experimental research. It can contribute to medical science in two ways; as a source of new knowledge and in medical education and audit<sup>6,8,47,56, 60-64</sup>. Useful information and evidences also can be synthesized by doing meta-analysis of case reports<sup>7</sup>.

#### *Pitfalls in Quality of Case Report*

Although many of the case reports are academically worthy they cannot be accepted due to poor writing quality and improper format<sup>6</sup>. This may result from lack of experience in scientific writing. One of the common causes of poor quality may result from poor documentation. Sometimes common or widely reported cases are thought to be rare due to poor literature review. Inadequate care or improper management resulting from misunderstanding of pathophysiology may result in an event seems to be unique but cannot be the thing to be published. Quality of a case report may be compromised as a result of inadequate focusing on primary message. A case may be difficult to understand by the readers due to complex or unusual illustrations. Useful information will be weakly supported due to poor use of references<sup>47</sup>.

#### *Elements of a Case Report*

In most of the articles it is found that it the shortest of all publications. The constant components are introduction, case summary, discussion and references<sup>47</sup>.

#### *Weaknesses and Strengths of the Case Report*

The major weakness is its small sample size. An exceptional case cannot be generalized. Report on cases can provide a data or information to generate

research questions and hypothesis in the clinicians' mind but should not be considered as established evidence. A case report is prepared usually retrospectively and may not be based on systemic observation so there is a chance of missing relevant information. More importantly the associations may have their own explanations. The dangerous aspect is that there may be emphasis on the bizarre element or focusing on a misleading item<sup>8,55</sup>. The design pitfall should be kept in mind such as inadequate description of the case. The observation may be biased with subjective variation<sup>31</sup>. Confidentiality may be difficult to preserve in an isolated case report<sup>8</sup>.

There are usually little or no ethical issues in case report. Someone can report a case and learn from mistakes and this is the only way to have a 'natural experiment' to invent new things<sup>8</sup>. One advantages of case report from authors view is its low volume and cost involvement. The other favorable point is its structural flexibility to express the finding and analysis<sup>33</sup>. The strength of case report is that it can be published quickly to notice and warn on unusual events to the clinicians<sup>54,65</sup>.

#### **Limitations**

The authors could not go through all the relevant literature as the number of publications is so many. It was also difficult to manage time to look at every detail. There are numerous publications on each aspect pointed out and the authors had selected only few to refer. Only on medical case reporting was discussed and as a result other aspects could not be analyzed.

#### **Conclusion**

The importance of writing case reports are gaining attention day by day. Information in case report should not have an impact on practice of health care as other research articles. It should be used to make others aware of unusual presentations or complications. It is a time honored method for teaching others. News syndromes, manifestations, associations, complications, or outcomes are most appropriate subjects for publishing a case reports.

## References

1. American College of Physicians (ACP), Writing a Clinical Vignette (Case Report) Abstract; 2013 viewed on 04/04/2013 from [http://www.acponline.org/residents\\_fellows/competitions/abstract/prepare/clinvin\\_abs.htm](http://www.acponline.org/residents_fellows/competitions/abstract/prepare/clinvin_abs.htm).
2. Dib EG, Kidd MR and Saltman DC. Case reports and the fight against cancer. *Journal of Medical Case Reports* 2008;2:39 <http://www.jmedicalcasereports.com/content/2/1/39>.
3. McCarthy LH and Reilly KEH, How to write a case report. *Family Medicine*, March 2000; 32(3): 190-195.
4. Coccia CT, Ausman JI. Is a case report an anecdote? In defense of personal observations in medicine. *SurgNeurol* 1987; 28:111-13.
5. Iles RL, Piepho RW. Presenting and publishing case reports. *J ClinPharmacol*.1996; 36:573-579.
6. Gopikrishna V, A report on case reports, *J Conserv Dent*. 2010 ; 13(4): 265-271.
7. Jenicek M. *Clinical Case Reporting in Evidence-Based Medicine*. Oxford: Butterworth-Heinemann; 1999:117.
8. Nissen T and Wynn R. The recent history of the clinical case report: a narrative review. *J R Soc Med Sh Rep* 2012; 3:87. DOI 10.1258/shorts.2012.012046.
9. Azad AK 2006, Type and design of study in planning and doing research, pp. 20-57.
10. Khanam ST 1996, *Research methodology, basic concepts*, Dhaka.
11. Mahajan BK 1997, *Methods in biostatistics*, ed. 6th, Jaypee Brothers, New Delhi
12. Tolwani A. Research model designs. In: Nordness R, ed. *Epidemiology and Biostatistics Secrets*. Philadelphia: Mosby Elsevier, 2006.
13. Venes D. *Taber's Cyclopedic Medical Dictionary*. 21st edn. Philadelphia: F. A. Davis Company, 2009.
14. Case Report, Himmelfarb Health Sciences Library, the George Washington University, Nov 2011, mretrived on 13/04/2013 from <http://www.gwumc.edu/library/tutorials/studydesign101/casereports.html>.
15. Fletcher RH, Fletcher SW. Clinical research in general medical journals. A 30-year perspective. *N Engl J Med*. 1979; 301:180-3.
16. Jenicek M. *Clinical case reporting in evidence-based medicine*.2nd ed. Oxford: Butterworth-Heinemann; 2001.
17. Green BN and Johnson CD, Writing Patient Case Reports for Peer-reviewed Journals: Secrets of the Trade, *Journal of Sports Chiropractic & Rehabilitation* 2000; 14(3): 51.
18. Abu-Zidan FM, Abbas AK, Hefny AF. Clinical "case series": a concept analysis. *African Health Sciences* 2012; (4): 557 - 562.
19. Grimes DA, Schulz KF. Descriptive studies: what they can and cannot do. *Lancet*. 2002; 359: 145- 149.
20. Patterson PD, Weaver M, Clark S, Yealy DM. Case reports and case series in pre-hospital emergency care research. *Emerg Med J* 2010; 27: 807-809.
21. Hennekens CH, Buring JE, Mayrent SL, eds. *Epidemiology in Medicine*. First edition, USA: Little, Brown and company Boston/Toronto; 1987.
22. Keating JC. *Towards a philosophy of the science of chiropractic: a primer for clinicians*. Stockton, CA: Stockton Foundation for Chiropractic Research; 1992:199-222.
23. Anwar-ul-haq, Ubaidullah ,Samiullah, Javeria, Neelofar, Abbasi MZ, Surgical ligation of patent ductusarteriosus in a noncardiac Surgical centre. *J Ayub Med Coll* 2009;21(3): 25-28.
24. Aziz MM, Khan AW, Uddin MF, Hasnat MA, Kader MA, Chowdhury AJ, Chowdhury NA. Endoscopic parathyroidectomy: A new Approach. *Mymensingh Med J* 2010 Jul; 19(3): 442-446.
25. Keating JC, Giljum K, Menke M, Lonczak RS, Meeker WC. Toward an experimental chiropractic: time series designs. *J Manipulative Physiol.Ther*. 1985; 8(4):229- 238.
26. Azzaldeen A, Muhamad AH and Watted N. Dental case report for publication; step by step; *Indian Journal of Medical Case Reports* 2014 Vol.3 (1) January-March, pp. 94-100.
27. Riddoch J. Evaluation of practice. *Physiotherapy* 1991; 77(9):439-444. From <http://www.physiotherapyjournal.com/article/S0031-9406%2810%2961299-0/abstract>
28. Sorinola O, Olufowobi O, Coomarasamy A and Khan KS. Instructions to authors for case reporting are limited: A review of a core journal list. *BMC Medical Education* 2004; 4:4 from: <http://www.biomedcentral.com/1472-6920/4/4>
29. Kljakovic M. Single cases in general practice and general medical journals. *Aust. Fam. Physician* 2002;31(7):669-673.[pub med abstract]
30. Peveler R, Kilkenny L, Kinmonth AL. Medically unexplained physical symptoms in primary care: a comparison of self-report screening questionnaires and clinical opinion. *J Psychosom Res*. 1997 Mar;42(3):245-52
31. Doherty M 1994. What values case report? *Annals of the Rheumatic Diseases*. 1994; 53: 1-2.

32. Rison RA, Kidd MR and Koch CA The CARE (CAsEReport)guidelines and thestandardization of case reportsJournal of Medical Case Reports 2013, 7:261<http://www.jmedicalcasereports.com/content/7/1/261>
33. Agha R, Rosin DR. Time for a new approach to case reports. *Int J Surg Case Rep.* 2010 May;1(1):1-3.
34. Varras M. Clinical and educational significance of case reports in medicine. *OA Case Reports* 2012; 1(1):1.
35. Anecdote, Wikipedia, from [http:// en.wikipedia.org/wiki/ Anecdote](http://en.wikipedia.org/wiki/Anecdote), last modified on 3 April 2013.
36. Anecdotal evidence, Wikipedia, from [http:// en.wikipedia.org/wiki/ Anecdotal\\_evidence](http://en.wikipedia.org/wiki/Anecdotal_evidence), last modified on 25 February 2013.
37. Dictionary.com, 2013 from [http:// dictionary.reference.com/browse/Anecdote?r=75&src=ref&ch=dic](http://dictionary.reference.com/browse/Anecdote?r=75&src=ref&ch=dic)
38. Kidd M and Hubbard C. Introducing Journal of Medical Case Reports. *Journal of Medical Case Reports* 2007, 1:1. from: <http://www.jmedicalcasereports.com/content/1/1/1>
39. Wong G. Case reports: A helping hand to generalists. *Journal of Medical Case Reports* 2008, 2:311.
40. Târcoveanu E, Roca M, Mih?escu T. [Writing and publication of a clinical case report]. *Chirurgia (Bucur)*. 2011; 106(5):581-4. [Article in Romanian]
41. Pascal RR. Case reports-desideratum or rubbish? *Hum Pathol* 1985; 16:759.
42. Richtsmeier WJ. Case report. *Arch Otolaryngol Head Neck Surg* 1993; 119:926.
43. Simpson RJ Jr, Griggs TR. Case reports and medical progress. *Perspect. Biol. Med.* 1985; 28:402-6.
44. Treasure T. What is the place of the clinical case report in medical publishing? *J R Soc. Med* 1995; 88:279
45. Friedell MT. The case report. *Int. Surg* 1973;58:225.
46. Morgan PP. Why case reports? *Can Med Assoc J* 1985;133:353.
47. Pierson DJ. Case Reports in *Respiratory Care, Respir. Care* 2004; 49(10):1186 -1194.
48. Association of physicians. Case report, case series and systemic review. *QJMed* 2002; 95: 195-198.
49. White A, Writing case reports - authors guideline for Acupuncture in medicine, *Acupuncture in medicine* 2004; 22(2): 83 -86.
50. Wright SM, Kouroukis C. Capturing zebras: what to do with a reportablecase. *CMAJ* 2000; 163(4):429-431.
51. Vandembroucke JP. In defense of case reports and case series. *AnIntern Med* 2001; 134(4):330-334.
52. Fenton JE, Khoo SG, Ahmed I, Ullah I, Shaikh M. Tackling the case report. *AurisNasus Larynx.* 2004;31:205-207.
53. DeBakey L, DeBakey S. The case report. Guidelines for preparation. *Int J Cardiol.* 1983; 4(3):357-64.
54. Marone U. Case reports: More than anecdotal evidence. *J Clinic Case Reports.*2012; 2:e111.
55. Hoffman JR. Rethinking case reports, Highlighting the extremely unusual can do more harm than good. *WJm,* 1999; 170:253.
56. Huth EJ. Writing and publishing in medicine. Baltimore: Lippincott Williams and Wilkins; 1999. pp. 103-10.
57. GhamraZ andStoller JK. Basilar Hyperlucency in a Patient With Emphysema due to Hypocomplementemic Urticarial Vasculitis Syndrome. *Respir Care* 2003;48(7):697- 699.
58. El-Khatib MF, Kiwan RA, Jamaledine GW. Buspirone Treatment for Apneustic Breathing in Brain Stem Infarct. *Respir Care* 2003;48(10):956-958.
59. Manali et al. Endobronchial findings of fibrosingmediastinitis. *Resp Care*2003;48(1):1038-42.
60. Asgary S. Furcal perforation repair using calcium enriched mixture cement. *J Conserv Dent.* 2010;13:156-8.
61. Asgary S, Ehsani S. Permanent molar pulpotomy with a new endodontic cement: A case series. *J Conserv Dent.* 2009;12:31-6.
62. ChakradharRaju RVS, Sathe N, Morisetty P, Veeramachaneni C. Endodontic management of a maxillary first molar with unusual location of second mesiobuccal orifice. *J Conserv Dent.* 2010;13:162-4.
63. Rachana D, Nadig P, Nadig G. The palatal groove: Application of computed tomography in its detection - A case report. *J Conserv Dent.* 2007; 10:83-8.
64. Tandri SB. Management of infected radicular cyst by surgical decompression. *JConserv Dent.* 2010; 13:159-61.
65. Varras M. Clinical and educational significance of case reports in medicine. *OA Case Reports* 2012; 1(1):1.

## Foods For People With Kidney Diseases: Fundamental Guidelines & Choice

\*MM Rahman<sup>1</sup>, N Mahmood<sup>2</sup>, A Rahman<sup>3</sup>, TT Sajani<sup>4</sup>, K. Alo<sup>5</sup>

<sup>1</sup>*Prof. Dr. Md. Mahfuzar Rahman, Professor and Head, Dept. of Community Medicine, AKMMC*

<sup>2</sup>*Dr. Nazneen Mahmood, Assoc. Professor and Head, Dept. of Nephrology, AKMMC*

<sup>3</sup>*Dr. Md. Atiqur Rahman, Assoc. Professor, Dept. of Community Medicine, AKMMC*

<sup>4</sup>*Dr. Tabassum Tahmin Sajani, Asstt. Professor, Dept. of Community Medicine, AKMMC*

<sup>5</sup>*Dr. Kamrunnahar Alo M.Phil Part-I (Physiology course) at Sir Salimullah Medical College (SSMC), Dhaka*

*\*Corresponding Author*

*Date of Submission: 26.08.2015*

*Date of Acceptance: 13.10.2015*

### ABSTRACT

Chronic Kidney Disease (CKD) leads to increased cardiovascular mortality and a loss of disability-adjusted life years. In addition lack of data / information in most low- and middle-income countries made it difficult to ascertain the true burden. Moreover, high incidence and prevalence of CKD is being driven by regional and global increase in the prevalence of Diabetes Mellitus (DM), hypertension, obesity and aging in particular. Community surveys indicate people with end-stage kidney disease are only the tip of "CKD iceberg." Therefore, preventive strategies of CKD must involve educating the population creating public awareness with early detection of CKD. The paper highlights categories of healthy foods for the people with kidney diseases for one's better choice and alternatives in choosing one's meal plan. Therefore, to deal with CKD emphasis should be given on people's awareness about fundamental guidelines and choice of available foods in order to prepare a kidney friendly diet towards better and prolong life.

**Key Words:** CKD, Incidence, Prevalence, Kidney Friendly Diet

### Introduction

Persons more than 65 years of age constitute a substantial and growing fraction of people having the End-Stage Renal Disease (ESRD)<sup>1</sup>. Renal Data System of US (USRDS) indicates that the incidence rates of ESRD have continued to increase among those 65 and older<sup>2</sup>. Studies examining the factors affecting survival of elderly patients put on dialysis, age at start of dialysis and multiple co morbidities have been found most implicated<sup>3-5</sup>. However, a recent study showing dialysis might not offer a survival benefit in patients over 75 ages with multiple co morbidities, especially if having ischemic heart disease<sup>6</sup>. Moreover, functional dependence, impaired intellectual status, diabetes, malnutrition (low serum albumin) peripheral vascular disease and late referral for ESRD treatment are also seen as poor prognostic factors in the elderly<sup>7-8</sup>. Diet will vary based on general needs, but will be most impacted by the stage of kidney failure and of end-

stage renal disease. Studies have shown that irrespective of type of dialysis received a low protein diets (hypoproteic) can help postpone dialysis<sup>9</sup>. Protein is important in diet because it helps keep the body nourished and healthy to fight off potential infections, repair tissue and for growth. A healthy diets overall the best to select trimmed cuts of meat or low fat dairy. Nuts and beans are also a good source of protein, but also contain phosphorus. Moreover, a hyperkalemia or high level of potassium in the body is associated with a significant increase in an irregular heartbeat and sudden death as well<sup>10</sup>. Therefore, preventive strategies of CKD must involve educating the population on how to prevent renal disease; risk involved in the development of CKD; public awareness on food for the people with kidney diseases, lifestyle of susceptible individuals; early detection of CKD; and creating facilities for global assistance in generation database<sup>11</sup>.

In considering CKD it is important to maintain healthy weight with low salt intake to control blood pressure, a meal that will control DM. The basis and guidelines of the meal plan for a kidney friendly diet deserves consideration of calories, protein, carbohydrates, fat, nutrition facts and portion. However, role of dieticians in that case is vital for consultation. In a diet calorie comes from protein, carbohydrate and fat but it is to be remembered that one's need depends on individual age, sex, body size and activities and thus be adjusted as per body weight goals.

In addition, *protein* is needed but too much of it can be a problem. Again the amount of protein depends on body size & activity level. It is recommended to limit protein or change their sources. One can follow the sources of lower protein foods and higher protein foods mentioned below:

Lower protein foods includes; bread, fruits, vegetables, pasta and rice

Higher protein foods includes; meat, poultry, fish, eggs

Carbohydrates are the easiest energy source in use but healthy sources include fruits and vegetables and unhealthy sources are sugar, honey, hard candies & soft drinks. Moreover some carbohydrates are high in potassium and phosphorus that is to be considered as per the stage of CKD. A person with additional DM it is wise to take help in dealing carbohydrate in the meal plan with a dietitian in particular.

Too much *fat* can lead to weight gain and heart disease therefore choice of healthier fats in a meal plan is essential e.g. unsaturated fats Olive oil, Vegetable oils. It helps reducing cholesterol. If one need gaining weight it is better to eat more unsaturated fats but if losing weight is concern limit unsaturated fat? Consider examples of bad fat (Saturated) that includes; butter, lard, meats. However, removing the skin from chicken can help limit saturated fat.

Be careful with *salt substitutes* in reducing sodium in foods. Many salt substitutes are high in potassium which is dangerous for someone suffering with CKD.

The following *nutrition facts* will help deciding how much protein; carbohydrates, fat and sodium are in each serving of a food. One can pick it up that are

high in nutrients that is needed and low in nutrient should limit.

Eating too much of healthy food can be a problem and thus to control one's *portions / part or share* eat slowly and stop eating when not hungry anymore if anyone eat too quick there is chance of eating more than need. Avoid eating while doing something like TV watching, driving as it is distracting hoe much eating. It is good to avoid eating directly from package instead taking out one serving of food and put the bag or box away.

Limit *potassium, phosphorus, and fluids* in consultation with physician or dietitian in particular. The following examples are the high and low potassium, and phosphorus containing foods one can choose in consultation with physician or dietitian.

**Lower potassium foods includes;** apple, grapes, strawberries, cauliflower, onion, lettuce, pita, white bread

**Higher potassium foods includes;** bananas, melons, oranges, potatoes, tomatoes, beans

**Lower phosphorus foods includes;** rice cereals and cream of wheat unsalted popcorn, some light colored sodas & lemonade

**Higher phosphorus foods includes;** whole-grain bread, bran cereals and oatmeal, nuts and sunflower seeds, dark-colored colas

One may not need much *fluid* due damage in kidney and too much will be dangerous. It can lead to high blood pressure, swelling and heart failure. Extra fluid will affect lungs and will make hard to breath. Limit fluid in consultation with physician or dietitian on how much one can drink. Foods that melt like; ice, ice cream and gelatin have lot of water. It is true for many other fruits & vegetables that must be taken in consideration to avoid extra fluid. Limit sodium to help cut down on thirst. If one still feel thirsty might try with chew gum, by rinsing mouth.

Take help of your physician or dietitian about any *vitamins, supplements or over the counter medicines* that one taking. Some may be harmless, but other can be dangerous for kidney more or can cause other health problems<sup>12</sup>.

## Literature Review

Kidneys filter toxins from your body and regulate body fluids and electrolytes sodium and potassium. Its failure results immediate symptoms of nausea and vomiting due to toxin in the blood. People having chronic kidney disease can be able to modify their diets to reduce stress on these vital organs although no diet is good for everyone. Dietician & physician (nephrologists in particular) in consultation with patient can make a meal plan specific for you in addition to follow up laboratory tests. This article highlights categories of healthy foods for the people of kidney disease as an option to choose.

In **BREAKFAST** one egg is enough to meet the demand of protein without much of added fat. In addition white toast and a small glass of skim milk will be suitable as a kidney-preserving meal.

**LUNCH** may include many colored vegetables as salad with some grilled chicken to start. Low fat salad dressing is preferable. In maintain hydration between meals a large glass of water will be enough.

**DINNER** may add a fruit beverage that may help maintaining a well balanced diet within list of fruits restrictions. Additional one piece of 6 oz grilled salmon, with some steamed white rice can be a better choice along with half a fresh banana for dessert.

*(Source: Meal Plan for Kidney Diseases Last updated: Feb 21, 2014 by Jennifer)<sup>14</sup>*

Moreover, foods that contain antioxidants can help neutralize free radicals and protect body. Many of such foods can be an excellent choice and be included in the kidney diet or people with CKD. The **quantity and composition** of TOP 15 health foods for people with kidney diseases are furnished below as an option or choices to make diet health and friendly as well. However, some of those may not be available in the local market in many countries.

Sl. no	Name of foods	Quantity	Composition	Remarks
1	<i>Red bell peppers</i>	Half cup serving	1 mg sodium 88 mg potassium 10 mg phosphorus	Low potassium, tasty vegetable, source of Vit C & A. Also an appetizer
2	<i>Cabbage</i>	Half cup serving	6 mg sodium 60 mg potassium 9 mg phosphorus	High Vit K, C and fiber. Good source of Vit B6 & folic acid & in low potassium & low cost
3	<i>Cauliflower</i>	Half cup serving boiled	9 mg sodium 88 mg potassium 20 mg phosphorus	High in Vit C & good source of folate and fiber
4	<i>Garlic</i>	1 clove	1 mg sodium 12 mg potassium 4 mg phosphorus	Prevent plaque, lowers cholesterol & reduce inflammation
5	<i>Onions</i>	Half cup serving	3 mg sodium 16 mg potassium 3 mg phosphorus	Powerful antioxidant works to reduce heart disease & protect many cancer
6	<i>Apples</i>	1 medium apple with skin	0 mg sodium 158 mg potassium 10 mg phosphorus	Reduce cholesterol, prevent constipation, protect heart disease & reduce risk of cancer. High fiber, anti-inflammatory. <b>Apple a day keep doctor away</b>
7	<i>Blue berries</i>	Half cup serving fresh	4 mg sodium 65 mg potassium 7 mg phosphorus	High in anti-oxidant & a good source of Vit C
8	<i>Cranberries</i>	Half cup serving dried	2 mg sodium 24 mg potassium 5 mg phosphorus	Protect bladder infection & stomach ulcer. Also protect cancer & heart disease
9	<i>Raspberries</i>	Half cup serving	0 mg sodium 93 mg potassium 7 mg phosphorus	Source of manganese, Vit C, fiber and folate & Vit B. Inhibit cancer cell growth & tumor formation
10	<i>Strawberries</i>	Half cup serving fresh (5 medium)	1 mg sodium 120 mg potassium 13 mg phosphorus	Source of Vit C, manganese & fiber, Protect heart, having anti-cancer & anti-inflammatory
11	<i>Cherries</i>	Half cup serving fresh	0 mg sodium 160 mg potassium	Reduce inflammation, Anti-oxidant & protect

(Source: Da vita renal dietitian, Sara Colman, RD, CSR, CDE)<sup>15</sup>

## Conclusion

A well balanced diet plan is important for maintaining good health in case of CKD but compliance, choice and consideration in addition to consultation with nephrologists and dietitian is important because it help prevent further damage of the kidneys. Depending on the stage of CKD it is better to limit potassium, phosphorus and fluids.

## Recommendations

- It is important educating people through public awareness program how to prevent kidney disease, and the risk involved in CKDs
- Importance should be given through motivation of the population in choosing healthy foods having kidney disease and its compliance in consultation with nephrologists & dieticians in particular
- Regular follow up evaluation & monitoring is important for better compliance & confidence among clients & providers
- Cost minimization & choice of treatment options should be rational & well informed
- A large scale community based survey is essential to generate real scenario of kidney disease in our setting to have a data base in making future plan of action.
- Measures should be taken towards early detection & prevention of Kidney diseases through active surveillance including other Non Communicable Diseases (NCDs) like; Diabetes, Hypertension, Cancer, Obesity, and Aging in particular

## Conflict of Interest

The authors have no conflict of interest to anybody

## References

1. Stel VS, van de Luijngaarden MW, Wanner C et al. The 2008 ERA-EDTA Registry Annual Report - a precis. *NDT Plus*. 2011;4(1):1-13.
2. Coresh J, Selvin E, Stevens LA et al. Prevalence of chronic kidney disease in the United States. *JAMA*. 2007;298:2038-2047.
3. Chandna SM, Schuz J, Lawrence C et al. Is there a rationale for rationing chronic dialysis? A hospital based cohort study of factors affecting survival and morbidity. *BMJ*. 1999; 318: 217-223.
4. Verdalles U, Abad S, Aragoncillo I et al. Factors predicting mortality in elderly patients on dialysis. *Nephron Clin Pract*. 2010;115:c28-c34
5. O'Hare AM, Choi AL, Bertenthal D et al. Age affects outcomes in chronic kidney disease. *J Am Soc Nephrol*. 2007;18: 2758-2765.
6. Murtagh FE, Marsh JE, Donohoe P et al. Dialysis or not? A comparative survival study of patients with chronic kidney disease stage 5. *Nephrol Dial Transplant*. 2007;22:1955-1962.
7. Smith C, Da Silva-Gane M, Chandna S et al. Choosing not to dialyze: evaluation of planned non dialytic management in a cohort of patients with end-stage renal failure. *Nephron Clin Pract*. 2003;95:c40-c46.
8. Joly D, Anglicheau D, Alberti C et al. Octogenarians reaching end-stage renal disease: cohort study of decisionmaking and clinical outcomes. *J Am Soc Nephrol*. 2003; 14: 1012-1021.
9. Capusa C, Garneata L, Mircescu G, Stancu, S. Effects of a Supplemented Hypoproteic Diet in Chronic Kidney Disease. *Journal of Renal Nutrition*, May 2007;17(3).
10. Sudden Cardiac Death in Hemodialysis Patients: An In-Depth Review. *American Journal of Kidney Disease*. [http://www.ajkd.org/article/S0272-6386\(11\)00595-6/fulltext#sec2.4](http://www.ajkd.org/article/S0272-6386(11)00595-6/fulltext#sec2.4)
11. Burden of Chronic Kidney Disease: An International Perspective. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/20439090>
12. Kidney-Friendly Diet and Foods: Healthy Eating for People with Chronic Kidney Disease. Available from: <http://www.kidneyfund.org/kidney-disease/kidney-friendly-diet-ckd/>
13. Control kidney disease through diet. Available from: <http://timesofindia.indiatimes.com/life-style/health-fitness/health-news/Control-kidney-disease-through-diet/articleshow/5433294.cms>
14. Jennifer Hartford Meal Plan for Kidney Diseases Last Updated: Feb 21, 2014
15. Sara Colman, RD, CSR, CDE Top 15 Healthy Foods for People with Kidney Disease by DaVita® renal dietitian.

## Pulmonary Embolism with Floating Right Atrial Thrombus Successfully Treated with Streptokinase

S Nasrin<sup>1</sup>, M Salahuddin<sup>2</sup>, \*FA Cader<sup>3</sup>, J Iqbal<sup>4</sup>, T Nazrin<sup>5</sup>, MJ Shafi<sup>6</sup>, N Ghafoor<sup>7</sup>

<sup>1</sup>Dr. Sahela Nasrin, Associate Consultant & Assistant Professor, Department of Cardiology, Ibrahim Cardiac Hospital & Research Institute (ICHRI), Dhaka

<sup>2</sup>Dr. Mohammad Salahuddin, Registrar and Specialist, Department of Cardiology, Ibrahim Cardiac Hospital & Research Institute (ICHRI), Dhaka

<sup>3</sup>Dr. Fathima Aaysha Cader, Assistant Registrar, Department of Cardiology, Ibrahim Cardiac Hospital & Research Institute (ICHRI), Dhaka

<sup>4</sup>Dr. Md. Javed Iqbal, Registrar and Specialist, Department of Cardiology, Ibrahim Cardiac Hospital & Research Institute (ICHRI), Dhaka

<sup>5</sup>Dr. Tahera Nazrin, Associate Consultant & Assistant Professor, Department of Paediatric Cardiology, Ibrahim Cardiac Hospital & Research Institute (ICHRI), Dhaka

<sup>6</sup>Dr. Masuma Jannat Shafi, Registrar and Specialist, Department of Cardiology, Ibrahim Cardiac Hospital & Research Institute (ICHRI), Dhaka

<sup>7</sup>Dr. Nusrat Ghafoor, Associate Consultant, Department of Radiology & Imaging, Ibrahim Cardiac Hospital & Research Institute (ICHRI), Dhaka

\*Corresponding Author

Date of submission: 20 January 2015

Date of acceptance: 15 April 2015

### ABSTRACT

Massive Pulmonary Embolism (PE) is associated with significant mortality, especially if compounded by haemodynamic instability, right ventricular dysfunction and right atrial thrombus. Thrombolysis can be lifesaving in patients with major embolism and cardiogenic shock, and accelerates the resolution of thrombus. Only three fibrinolytic agents - namely streptokinase, urokinase, and recombinant tissue plasminogen activator (Alteplase) have been approved in the treatment of PE, with studies demonstrating similar safety profiles. We report the case of a 33 year old Bangladeshi female with a history of recent ankle fracture and immobilization, who presented with massive PE, leading to cardiac arrest. Upon rapid resuscitation, urgent echocardiogram revealed right ventricular dysfunction with floating right atrial thrombus, and she was successfully treated with 1.5 million IU of Streptokinase over 2 hours as per accelerated regimen recommended by the European Society of Cardiology (ESC) guidelines, resulting in successful resolution of the right heart thrombus, and significant clinical improvement. Subsequent CT Pulmonary Angiogram confirmed the diagnosis of PE, and she was anticoagulated to a PT/INR of 2.0 to 3.0.

**Key Words:** massive pulmonary embolism, right atrial thrombus, streptokinase

### Introduction

Massive pulmonary embolism (PE) is frequently complicated with hypotension and shock, leading to mortality rates exceeding 50%.<sup>1,2</sup> Patients with right ventricular (RV) dysfunction are another subgroup with a guarded prognosis,<sup>3</sup> as are those with right heart thrombus.<sup>4-6</sup> These patients in particular, benefit from more intensive therapy with thrombolytic agents in comparison to anticoagulant therapy alone, resulting in reduced mortality to less than 30%.<sup>2,6</sup> Thrombolytic therapy accelerates the resolution of PE, while reducing its recurrence and

improving other parameters, such as pulmonary blood flow, lung perfusion, and right ventricular dysfunction.<sup>4,7</sup> Streptokinase, Urokinase and recombinant tissue plasminogen activator (Alteplase) are the thrombolytic agents approved for the treatment of PE, with Alteplase being explicitly identified as the agent indicated for acute massive PE.<sup>7</sup> This case report aims to demonstrate the importance of prompt imaging and intervention, and the superior efficacy of thrombolysis in complicated massive PE.

### Case Report

A 33 year old normotensive, non-diabetic Bangladeshi female presented with sudden onset severe retrosternal chest pain and two episodes of syncope over four hours. Chest pain was worse on deep inspiration and associated with shortness of breath, orthopnoea and palpitations for 2 days. She had an ankle fracture and was on a cast with plaster immobilization for the preceding month, and admitted to unilateral leg pain and swelling.

On admission, she was cyanosed with gasping respiration; pulse & BP were non-recordable. She developed asystole soon after, and reverted to sinus rhythm following two minutes of Cardio Pulmonary Resuscitation (CPR). After resuscitation, heart rate was 136 beats/min and blood pressure was 80/55mmHg. SpO<sub>2</sub> was 90%. Respiratory rate was 35 breaths/min. She was given high flow oxygen, Intravenous (IV) normal saline and dopamine infusion for hypotension. ECG revealed sinus tachycardia (rate 136/min), Right Bundle Branch Block (RBBB) with S<sub>1</sub>Q<sub>3</sub>T<sub>3</sub> pattern (Figure 1). Bedside echocardiogram revealed floating thrombus in right atrium (RA), dilated RA and RV, impaired RV function, mild Tricuspid Regurgitation & pulmonary hypertension with normal left ventricular systolic function (Figure 2). Immediate thrombolysis was done with IV Streptokinase 1.5 million units over 2 hours as per accelerated regimen of ESC guidelines, resulting in a subsequently normal ECG (Figure 3). This was followed by subcutaneous Low Molecular Weight Heparin (LMWH) for 5 days & oral warfarin titrated to a therapeutic PT/INR of 2.0 to 3.0. Subsequent CT Pulmonary Angiogram revealed an approximately 2cm filling defect in the descending branch of left pulmonary artery extending up to the lateral & posterior basal segmental arteries, suggesting thrombus (Figure 4). D-dimer assay was positive. Troponin- I was 1.27 ng /ml ( high risk - 0.11-0.60). Complete blood count revealed neutrophilic leucocytosis. Review echo done 2 days later revealed no thrombus or pulmonary hypertension, normal RA and RV. She was discharged on warfarin 5mg daily and was asymptomatic with therapeutic PT/INR at follow up. She denied use of the oral contraceptive pill and was advised against its use owing to its potential as a risk factor.



**Figure 1.** ECG showing sinus tachycardia, RBBB, S<sub>1</sub>Q<sub>3</sub>T<sub>3</sub> pattern.



**Figure 2:** Trans thoracic echocardiogram (TTE) 4 chamber view showing right atrial thrombus.



**Figure 3.** ECG after thrombolysis, showing normal sinus rhythm, rate 72beats/min.



**Figure 4.** CT Pulmonary Angiogram showing filling defect in the descending branch of Left Pulmonary artery suggesting thrombus

## Discussion

This case of acute PE presented in cardiorespiratory arrest and is classified as massive PE as per American Heart Association (AHA) definitions.<sup>7</sup> The AHA defines massive PE as acute PE with sustained hypotension (systolic blood pressure <90 mm Hg for at least 15 minutes or requiring inotropic support, not due to a cause other than PE), pulselessness, or persistent profound bradycardia (heart rate <40 bpm with signs or symptoms of shock).<sup>7</sup> ESC guidelines also classify suspected acute PE as 'high risk' on the basis of presence of shock or hypotension.<sup>4</sup>

Emergency multidetector CT should be performed in haemodynamically unstable patients, because of its 97% sensitivity for detecting emboli in the main pulmonary arteries.<sup>6,7</sup> If unavailable, echocardiography should be performed without delay.<sup>6,7</sup> Echocardiographic markers of RV dysfunction, such as RV dilatation (without hypertrophy), paradoxical septal systolic motion, and pulmonary hypertension are independent predictive factors of poor outcome in acute PE.<sup>8</sup> Echocardiography can also detect right heart thrombi, a marker of worse prognosis, the prevalence of which is 4% to 18% in the setting of an acute PE,<sup>9</sup> and usually found in those more haemodynamically compromised.<sup>5,6</sup> Free-floating right heart thrombi, are almost exclusively associated with pulmonary embolism.<sup>10,11</sup>

Elevated D dimers and positive cardiac troponin T or I, both of which have a high negative predictive value, can be used for immediate risk stratification.<sup>4,7,12</sup> A normal D-dimer level renders acute PE or DVT unlikely.

Scoring systems may be adopted for early risk stratification of patients, taking into account the clinical status and risk factors for venous thromboembolism (VTE) such as lower limb fractures, major trauma and surgery.<sup>7</sup> With a Well's Score of 9, and a Revised Geneva Score of 11, our patient had high clinical probability of PE.<sup>13-14</sup> She had a Pulmonary Embolism Severity Index (PESI) score of 103, putting her in Class III, with a 30-day moderate mortality risk of 3.2 to 7.1%.<sup>15</sup> According to 2014 ESC guidelines, she had high early mortality risk owing to shock, PESI class III-IV, RV dysfunction on imaging and positive cardiac laboratory markers, thus warranting primary reperfusion.<sup>4</sup> There is no contraindication to fibrinolysis in cases of cardiac arrest owing to PE, however thrombolysis is discouraged in those with undifferentiated cardiac arrest.<sup>7</sup> Where patient transport

for CT is unsafe, thrombolysis should be considered in case of unequivocal signs of RV overload on bedside echocardiography, and CT performed later.<sup>6</sup>

There are three thrombolytics approved for the treatment of PE by the Food and Drug Administration (FDA): Streptokinase, urokinase and alteplase, with Alteplase being explicitly identified as the agent indicated for massive PE in 2010.<sup>7</sup> There are no conclusive findings from studies comparing different thrombolytic regimens in acute PE, with most of them demonstrating similar safety profiles.<sup>16-18</sup> However, short infusion times (2 hours or less) are recommended over prolonged infusion times, as they achieve more rapid thrombolysis and probably less bleeding.<sup>7,19</sup>

Thrombolytic agents actively promote the hydrolysis of fibrin molecules, resulting in rapid resolution of thromboembolic obstruction, and faster restoration of pulmonary perfusion in the acute stage, with a 30% to 35% reduction in total perfusion defect at 24 hours in comparison with heparin alone.<sup>7,19</sup> This leads to a prompt reduction in pulmonary artery pressure and resistance, with a concomitant improvement in RV function, stabilization of respiratory and cardiovascular function, and prevention of PE recurrence.<sup>7</sup> Major contraindications include haemorrhagic or ischaemic stroke, recent major surgery or trauma or known bleeding risk.<sup>4,18</sup>

Thrombolysis has mortality benefit when compared either to anticoagulation or surgical thromboembolectomy, in cases of right heart thrombus.<sup>20</sup> Surgicalembolectomy is currently more frequent, but remains limited to patients unsuitable for thrombolysis. Catheter-based embolectomy is reserved for cases in which both thrombolysis and surgical embolectomy is possible.<sup>1</sup>

As patients with acute PE are at risk for recurrent thromboembolism, they should be given long-term anticoagulation. The recommendation for PE secondary to a reversible risk factor is therapy with vitamin K antagonists for 3 months, titrated to a target INR of 2.0 to 3.0.<sup>4,6</sup> Novel oral anticoagulants (NOACs) i.e. dabigatran, rivaroxaban and apixaban are as effective and safe as warfarin for the treatment of venous thromboembolism.<sup>4,6,7</sup>

Follow up of patients is important, due to implications of long term anticoagulation and the possibility of chronic thromboembolic pulmonary hypertension after an acute PE, the incidence of which is up to 3.8% two years after the acute event.<sup>21</sup>

## Conclusion

Acute massive PE can present with haemodynamic instability and RV dysfunction in predisposed patients. Floating RA thrombus, although rare, is an additional complication. Therefore, prompt diagnosis by confirmation with appropriate imaging techniques and rapid decision to thrombolise such cases can be life-saving.

**Acknowledgements :** None

## Conflict of Interest

The authors declare that they have no conflict of interest.

## References

- Meneveau N. Therapy for acute high-risk pulmonary embolism: thrombolytic therapy and embolectomy. *Curr Opin Cardiol* 2010; 25(6): 560-67.
- Jerjes-Sanchez C, Ramirez-Rivera A, de Lourdes Garcia M, Arriaga-Nava R, Valencia S, Rosado-Buzzo A, et al. Streptokinase & heparin versus heparin alone in massive pulmonary embolism: a randomized controlled trial. *J Thromb Thrombolysis* 1995; 2(3): 227-29.
- Kreit JW. The impact of right ventricular dysfunction on the prognosis and therapy of normotensive patients with pulmonary embolism. *Chest* 2004; 125(4): 1539-45.
- Konstantinides SV, Torbicki A, Agnelli G, Danchin N, Fitzmaurice D, Galiè N, et al. 2014 ESC Guidelines on the diagnosis and management of acute pulmonary embolism: The Task Force for the Diagnosis and Management of Acute Pulmonary Embolism of the European Society of Cardiology (ESC). *Eur Heart J* 2014; 35(43): 3033-73.
- Torbicki A, Galiè N, Covezzoli A, Rossi E, De Rosa M, Goldhaber SZ. Right Heart thrombi in pulmonary embolism: results from the International cooperative pulmonary embolism registry. *J Am Coll Cardiol* 2003; 41(2): 2245-51.
- Agnelli G, Becattini C. Acute Pulmonary Embolism. *N Engl J Med* 2010; 363(3): 266-74.
- Jaff MR, McMurtry MS, Archer SL, Cushman M, Goldenberg N, Goldhaber SZ, et al. Management of massive and submassive pulmonary embolism, iliofemoral deep vein thrombosis, and chronic thromboembolic pulmonary hypertension: a scientific statement from the American Heart Association. *Circulation* 2011; 123(16): 1788-830.
- Grifoni S, Olivetto I, Cecchini P, Pieralli F, Camaiti A, Santoro G, et al. Short-term clinical outcome of patients with acute pulmonary embolism, normal blood pressure, and echocardiographic right ventricular dysfunction. *Circulation* 2000; 101(24): 2817-22.
- Ferrari E, Benhamou M, Berthier F, Baudouy M. Mobile thrombi of the right heart in pulmonary embolism: delayed disappearance after thrombolytic treatment. *Chest* 2005; 127(3): 1051-53.
- X Hou, W Liu, Z Zhang, Z Li. Free-floating right atrial thrombus with acute pulmonary embolism. *Thorax* 2009; 64(8): 736.
- Chartier L, Bera J, Delomez M, Asseman P, Beregi JP, Bauchart JJ, et al. Free floating thrombi in the right heart: diagnosis, management, & prognostic indexes in 38 consecutive patients. *Circulation* 1999; 99(21): 2779-83.
- Becattini C, Vedovati MC, Agnelli G. Prognostic value of troponins in acute pulmonary embolism: a meta-analysis. *Circulation* 2007; 116(4): 427-33.
- Wells PS, Anderson DR, Rodger M, Ginsberg JS, Kearon C, Gent M, et al. Derivation of a simple clinical model to categorize patients probability of pulmonary embolism: increasing the models utility with the SimpliRED D-dimer. *Thromb Haemost* 2000; 83(3):416-20.
- Le Gal G, Righini M, Roy PM, Sanchez O, Aujesky D, Bounameaux H, et al. Prediction of pulmonary embolism in the emergency department: the revised Geneva score. *Ann Intern Med* 2006; 144(3): 165-71.
- Righini M, Roy PM, Meyer G, Verschuren F, Aujesky D, Le Gal G. The Simplified Pulmonary Embolism Severity Index (PESI): validation of a clinical prognostic model for pulmonary embolism. *Journal of Thrombosis and Haemostasis* 2011; 9(10): 2115-17.
- Urokinase-streptokinase embolism trial. Phase 2 results. A cooperative study. *JAMA* 1974; 229(12): 1606-13.
- Goldhaber SZ, Kessler CM, Heit J, Warkis J, Sharma GV, Dawley D, et al. Randomized control trial of recombinant tissue plasminogen activator versus urokinase in acute pulmonary embolism. *Lancet*. 1988; 2(8606): 293-98.
- Meyer G, Sors H, Charbonnier B, Kasper W, Bassand JP, Kerr IM, et al. Effects of intravenous urokinase versus alteplase on total pulmonary resistance in acute massive pulmonary embolism: an European multicentr double blinded trial. The European Cooperative Study Group for pulmonary embolism. *J Am Coll Cardiol* 1992; 19(2): 239-45.
- Kearon C, Kahn SR, Agnelli G, Goldhaber S, Raskob GE, Comerota AJ. Antithrombotic therapy for venous thromboembolic disease: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th Edition). *Chest* 2008; 133(6 Suppl): S454-545.
- Rose PS, Punjabi NM, Pearse DB. Treatment of right heart thromboemboli. *Chest* 2002; 121(3): 806-14.
- Pengo V, Lensing AW, Prins MH, Marchiori A, Davidson BL, Tiozzo F, et al. Incidence of chronic thromboembolic pulmonary hypertension after pulmonary embolism. *N Engl J Med*. 2004; 350(22): 2257-64.

**From the Desk of Editor in Chief**

I am happy that the volume 7 number 1 issue of Anwer Khan Modern Medical College Journal is published. We received many articles from outside Anwer Khan Modern Medical College and this proves the quality and acceptance of Anwer Khan Modern Medical College Journal among the Medical professional in and outside Bangladesh. We are following the standard format of a scientific Journal and will try to follow it very strictly.

The editorial on COPD is a timely & relevant topic now. The editorial has highlighted the strategies, for its better management. Article on "A Multicentre Based Observation of a screening tool to Differentiate Microcytosis and Hypochromia" compared a simple parameter microcyte & hypochromia for early diagnosis of Iron deficiency anaemia and beta thalassaemia trait. Paper on "Transfusion transmissible diseases among healthy blood donor attended at Transfusion Medicine Department of DMCH in 2014." have shown prevalence of HBsAg, anti HCV, MP, syphilis & HIV in Bangladesh donor population.

Article on "Awareness on Neonatal Care Among Rural Mothers of Reproductive Age Group Admitted in A tertiary Level Hospital at Mymensingh." highlighted importance of increased awareness programme to reduce neonatal mortality rate which is very high in Bangladesh.

Paper on "Cost Effective Cholecystectomy in A Rural Tertiary Care Hospital." compared the operating time between laparoscopic & open cholecystectomy and showed that laparoscopic cholecystectomy requires less time & complication.

Article on "Acceptability and Feasibility of Reducing Unsafe Abortion through Medication among Early Pregnant Women who are attending in RHSTEP at DMCH." showed the safe, effective & acceptable method for early termination of pregnancy. Expansion of this will lead to reduce unsafe abortion in Bangladesh.

Article on "Patterns of Cardiac Arrhythmia in Haemodialysis Patients." showed dialysis if self is not a leading risk factor for arrhythmias. But a patient with arrhythmia should be monitored during hemo & peritoneal dialysis to reduce arrhythmia risk.

Article on "Measurement of Oral Health Literacy Level Among Bangladesh Adults Seeking Dental Care and Its Relationship With Socio-demographic Characteristics." emphasises the role of literacy for adequate maintenance of oral hygiene. Illiteracy is more associated with bad oral hygiene.

Paper on "Isolation And Antimicrobial Susceptibility Pattern of Urinary Escherichia Coli In Dhaka Medical College Hospital, Bangladesh." Provided insight into high population of multidrug resistant E.coli in UTI and efforts should be made to aware patients, physicians to avoid indiscriminate use of antibiotics.

One of the important problems in geriatric population is sleep changes. Review article on "Sleep Changes with Aging". highlighted different aspects of sleep change with ageing.

Review article on "An overview of Report on Clinical Case Report" Highlighted the importance of writing a case report. A good scientific case report is now regarded as more important than original article.

Chronic Kidney Disease (CKD) requires guidelines for diet to reduce morbidity & mortality. Review article on "Foods for people with kidney diseases: Fundamental guidelines & choice", has focused on a balance dietary regime for CKD patients.

Case report on "Pulmonary Embolism with floating right atrial thrombus successfully treated with Streptokinase". highlighted effective thrombolysis by treatment high streptokinase reduced the floating pulmonary embolism. This will add a new dimension in treatment of pulmonary embolism, which is a cause of increased morbidity & mortality.

Overall volume-7, No-1 Anwer Modern Medical College Journal will be beneficial, Productive, research oriented & knowledgeable for the readers.

**Prof. Dr. Md. Tahminur Rahman**

Editor in Chief

AKMMC Journal

Email: mtahminur@yahoo.com

Phone: 008801817561519

## College News

New batch of 120 students were admitted in Anwer Khan Modern Medical College (Batch 8) and they have started their class from 10th January 2016. Among this 86 are local students & 34 foreign students (29 for Nepal, 5 for India)

Some new faculty member have joined the AKMMC since July 2015. Among them Prof. S.C Dhar as Professor of Gastroenterology, Prof Firoz Ahmed Quraishi as Professor of Neuromedicine.

As per decision of Academic council new head of the department were made in department of Medicine & Surgery. Prof. MU Hassan and Prof SM Arif are new head of department of Medicine & Surgery respectively.

The college authority with pleasure approved promotion of Md. Mahmudur Rahman Siddiqui, Assistant Professor of Medicine to Associate Professor (CC) of Medicine Dr. Gul Newaz Begum Associate Professor Anatomy as Professor (CC) of Anatomy from 2<sup>nd</sup> January 2016.

A high powered delegation of BCPS has visited Anwer Khan Modern Medical College & hospital for recognition of training in Surgery, Medicine, Gynae & Obs & ENT. The team visited different academic, administrative, hospital faculty of the Anwer Khan Modern Medical College & Hospital with satisfaction. We are waiting for successful out come of this visit very soon.

**List of CME & Seminar**

1. **20th Sept 2015.** Topic-"Importance of first 1000 days of life and Infant and Young Child Feeding (IYCF)". Presented by Dr. Mumtahina Setu, Assistant Professor of Paediatrics & Dr. Kuntal Roy, Registrar of Paediatrics, Anwer Khan Modern Medical College.
2. **25th to 31rd Oct 2015.** Breast Cancer Awareness Month & CME. organized by Department of Surgery & Department of Oncology of AKMMC.
3. **3rd Dec 2015.** World AIDS Day, Topic-"Muco-cutaneous manifestation of AIDS & Treatment Update". Presented by Dr. Mounira Yeasmin, Asstt. Professor of Dermatology & organized by Journal club committee & Medical education unit of AKMMC.
4. **27th Dec 2015.** Topic-"HIV/AIDS" (World AIDS Awareness Months-2015)- organized by Journal club committee & Medical education unit of AKMMC, IFMSA Bangladesh, SCORA.

## **General Information & Information for Authors**

### **Focus and Scope**

Anwer Khan Modern Medical College Journal (AKMMCJ) is a peer-reviewed journal for all medical professionals. This is the official journal of Anwer Khan Modern Medical College (AKMMC). The journal is recognized by Bangladesh Medical & Dental Council (BM&DC) and already indexed / enlisted in the following data bases: HINARI (WHO), BanglaJOL, AsiaJOL, Index Copernicus, Scientific Common, Open-j-get, Google Scholar, Proch, Cross Ref. Genamics JournalSeek & Global Impact Factor. We have got tremendous support from home and abroad. We have a vast reader from across the country and abroad. The journal publishes articles of authors from any part of the globe. It accepts original research articles, review articles, short communications, case report and letters to the editor. AKMMCJ published in English two times (January and July) in a year. Complimentary print copies of the journal are sent to libraries of all medical and other relevant academic institutions in the country. The journal also publishes in the following web sites (<http://banglajol.info/index.php/AKMMCJ> & [www.akmmc.edu.bd](http://www.akmmc.edu.bd)).

### **Editorial Policies**

#### **The journal has adopted the following editorial policies**

- Paper must be submitted with the understanding that they have not been published elsewhere (except in the form of an abstract, review) and are not currently consideration by another journal.
- The submitting (corresponding) author is responsible for ensuring that the article's publication has been signed approved by all the other coauthors (covering letter). Every effort of the Editorial Board and the Journal Committee is to avoid inaccurate or misleading information appearing in the AKMMCJ, information within the individual article is the responsibility of its authors. Journal committee is not liable for that. Similarly, advertisements appearing in this journal do not mean endorsement or approval of the quality or the value of the product by the AKMMCJ.
- All rights are reserved to the journal. No part may be reproduced or transmitted in any form or by any means without written permission from the editors.
- Authorship must be clearly stated and in order of descending frequency depending on the contribution on the paper. No gifted, guest or ghost authorship is allowed and this will be treated illegal.
- We strongly encourage authors to pay careful attention to the "Instruction for Authors" which is found in this section of each issue and journal website.
- The journal prefers to consider well designed studies with adequate data. The editorial board reserves the right to edit and if necessary, shorten any material accepted for publication. All manuscript will go through a double-blind peer-review process.

### **Open Access Policy**

This is an open access journal which means that all contents are freely available in the website without charge to the user. Users are allowed to read, download, copy, distribute without asking prior permission from the publisher or the author for non commercial Use.

### **Competing Interests**

This journal requires authors to declare any competing financial or conflict of interest in relation to their work. "The authors should declare that they have no competing interests".

### **Submit Manuscripts**

The AKMMCJ will accept manuscripts submitted as two hard copies with a soft copy or as email attachment to the editorial office at: akmmcj@gmail.com with a covering letter. A manuscript number will be mailed to the corresponding author within one week.

### **Types of Content**

#### **Submissions are invited in the following areas:**

**Editorials:** It will be preferably written by invited person / eminent physicians only and usually covers a single topic of contemporary interest.

**Original Articles:** Preference is given to those articles from and dealing with issues relevant to developing countries. These should describe new and carefully confirmed findings. An original research article should not exceed 7,000 words, including all illustrations and references.

**Review Article:** Submission of reviews and perspectives covering topics of current interest are encouraged. Review should be concise and no longer than 8,500 words, including all illustrations and references. It should be focused on topics of health interest and up to date.

**Short Communications:** A short communication is suitable for recording the result of complete small investigations or giving details of new models or hypothesis, innovative methods, techniques, images in clinical practice, letter to the editor, short reports. It should be with in 2,500 words including all illustrations and references.

**Case Reports:** This should cover uncommon and / or interesting cases with appropriate information. It Should be with in 2000 words.

#### **Preparing a Manuscript for Submission to AKMMCJ**

##### **Ethical Aspects**

- Ethical aspect of the study will be very carefully considered at the time of assessment of the manuscript.
- Any table, illustration or photographs that have been published earlier should accompany a letter of permission for re-publication from the author of the publication and editor/publisher of the journal where it was published earlier.
- Permission of the patients and / or their families to reproduce photographs of the patients where identify. Otherwise the identity will be blackened out.

##### **Preparation**

- Manuscripts should be typed in English on one side of A4 (290x210cm) size white paper with wide margins (5 cm for header and 2.5 cm for the remaining) & double space throughout. Use a normal plain font (11-point Times New Roman). All pictures should be in 300dpi.
- The modified Vancouver system should be followed to prepare the manuscripts.
- Each of the following section should be in separate page:

- o Title page
  - o Abstract
  - o Text
  - o Acknowledgement
  - o Conflict of interest
  - o References
  - o Tables and legends
-

---

● **Pages should be numbered consecutively at the upper right hand corner of each page**

1. **Title page:** Title page should have following information:

- a. Article title: Concise title is easier to read than long, convoluted one and too short title may lack of important information.
- b. Authors names, name of the department and institutional affiliations.
- c. The source of a work or study (if any).
- d. Contact information for corresponding author (The name, mailing address, telephone and e-mail address).
- e. The number of figures and tables. Total words count.

2. **Abstract**

A structured abstract of not more than 250 words are essential for original research article. It should be organized with the headings of Background (includes aims, hypothesis or objectives), Methods (includes patient population, procedures and data analysis), Results & Conclusions. This should be self explanatory without reference to the text. The first time an abbreviated term is used, spell it out in full and follow with the abbreviation. At the end of the abstract, there should be 2-3 key words.

3. **Main Text**

Main text should be divided into following pattern according to the type of article

- a. **Original Article:** Introduction, Materials and Methods, Results, Discussion, Conclusion & References.
- b. **Review Article:** Introduction, Discussion, Conclusion & References.
- c. **Case Report:** Introduction, Case Report, Discussion, Conclusion & References.

**Introduction:** Provide a background of the study (what is, the nature of the problem, its significance). It should be very specific, reasoning and what the study aim to answer. Stat the specific purpose, both the aims and objective should be clear. Provide only directly pertinent primary references and do not include data or conclusion from the work being reported.

**Materials & Methods:** Provide technical information about the study. Do not describe methodological details. Describe your selection of the subjects (patients or laboratory animals) clearly. Identify the methods, apparatus and procedures in sufficient details to allow other worker to reproduce the results. Identify precisely all drugs and chemicals used including generic names, dose & route of administration.

**Results:** Present your results in logical sequence in the text, tables, and illustrations. Do not repeat in the text all the data in the tables or illustrations; emphasized or summarize only important observations.

**Discussion:** Emphasize the new and important aspects of the study and the conclusions that follow from them. Do not repeat in detail data or other material given in the introduction or the results section. Describe the implications of the findings and their limitations, including implications for future research. Correlate the findings to the other relevant studies.

**Conclusion:** Link the conclusions with the goals of the study but avoid unqualified statements and conclusions not completely supported by your data. Recommendation when appropriate may be included.

4. **Acknowledgement**

**At an appendix to the one or more statements should specify**

- a. Contributions that need acknowledgement but do not justify authorship, such as general support by a department or departmental chairman;
  - b. Acknowledgement of technical help;
  - c. Acknowledgement of financial and material support;
  - d. Author should obtain written permission for everyone acknowledged by name; etc.
-

## **5. Conflict of interest**

All authors should disclose in their manuscript any financial or other substantive conflict of interest that might be construed to influence the results or interpretation of their manuscript.

## **6. Reference**

Reference should be written in modified Vancouver style, follow the ICMJE guidelines (<http://www.icmje.org>). Reference citations in the text should be identified by numbers. (e.g.4). Number the references in order of their first appearance in the text (not alphabetically). Once a reference is cited, all subsequent citations should be to the original number.

### **a. Standard journal article**

Siddiqui MR, Mondol BA. Ischaemic Stroke as a Presenting Feature of Polycythemia Rubra Vera- A Case Report. AKMMC J 2013; 4(1): 45-7.

### **For more than six authors**

Rose ME, Huerbin MB, Melick J, Marion DW, Palmer AM, Schiding JK, et al. Regulation of interstitial excitatory amino acid concentrations after cortical contusion injury. Brain Res. 2002; 935(1): 40-6.

Optional addition: PubMed PMID: 19329464 or doi.....etc.

### **b. Organization as author**

Diabetes Prevention Program Research Group. Hypertension, insulin and proinsulin in participants with impaired glucose tolerance. Hypertension 2002;40(5):679-86.

### **c. Volume with supplement**

QT Islam, MR Siddiqui, A Hossain, E Mustafa, MY Rahman, H Sina. Legg-Clave-Perthes Disease: A Rare Cause of Bilateral Avascular Necrosis of the Hip Joints. AKMMC J 2013; 4 Suppl 2: S40-1.

### **d. Issue with supplement**

Glauser TA. Integrating clinical trial data into clinical practice. Neurology. 2002;58(12 Suppl 7):S6-12.

### **e. Article published electronically ahead of print version**

Yu WM, Hawley TS, Qu CK. Immortalization of yolk sac-derived precursor cells. Blood. 2002 Nov 15;100(10):3828-31. Epub 2002 Jul 5.

## **Book and other monographs**

### **f. Personal author(s)**

Murray PR, Rosenthal KS, Kobayashi GS, Pfaller MA. Medical microbiology. 4th ed. St. Louis: Mosby;2002.

### **g. Editor(s), compiler(s) as author**

Gilstrap LC 3rd, Cunningham FG, VanDorsten JP, editors. Operative obstetrics. 2nd ed. New York: McGraw-Hill; 2002.

### **h. Author(s) and editor(s)**

Breedlove GK, Schorfheide AM. Adolescent pregnancy. 2nd ed. Wiczorek RR, editor. White Plains (NY): March of Dimes Education Services; 2001.

---

**i. Chapter in a book**

Meltzer PS, Kallioniemi A, Trent JM. Chromosome alterations in human solid tumors. In: Vogelstein B, Kinzler KW, editors. The genetic basis of human cancer. New York: McGraw-Hill; 2002. p. 93-113.

**j. Article on the internet**

World Health Organization. The world health report 2002 - Reducing risks, promoting healthy life [homepage on the Internet]. 2008 [cited 2008 Oct 10]. Available from: <http://www.who.int/whr/2002/en/>

National Institute for Health and Clinical Excellence. Type 2 13 diabetes-newer agents (partial update of CG66). (Clinical guideline 87.) 2009. <http://guidance.nice.org.uk/CG87>.

**7. Illustrations:** Illustrations submitted (line drawings, halftones, photos, photomicrographs, etc.) should be clean originals or digital files. Digital files are recommended for highest quality reproduction and should follow these guidelines:

- 300 dpi or higher
- sized to fit on journal page
- EPS, TIFF, and PDF formats are preferred. JPG and GIF formats are acceptable
- submit as separate files, not embedded in text files
- Colour photographs, tables, illustration can be published on payment (Per colour figure Tk 1000/- with maximum of 3 figures for one article)

**8. Tables and Figures:** Tables should be embedded in the text. All figures should be included as one separate sheet or file. A short descriptive title should appear above each table with a clear legend and any footnotes suitably identified below. All units must be included. Figures should be completely labeled, taking into account necessary size reduction. Captions should be typed, double-spaced, on a separate sheet. All original figures should be clearly marked in pencil on the reverse side with the number, author's name, and top edge indicated.

**9. Footnotes:** For uniformity of style, authors should use symbols for footnotes such as \*, §†,‡.

---