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Editorial

Dr Abdul Abyad

Chief Editor



There is marked improvement in the level of papers and diversity that the journal is receiving that indicates that one of our missions to stimulate research in the area in the field of ageing has been successful.

In this issue a cross sectional study was conducted on elderly patients in Cairo looked at the Prognostic value of hyponatremia in elderly Patients with Acute Coronary Syndrome

One hundred patients ,aged > 60 years, both males and females. All patients had a sodium level determined at time of admission and after 48 hours, serial ECG and cardiac enzymes (creatinine phosphokinase (CPK)and CPK-MB fraction)levels . Of 100 patients , 52 patients were admitted with STEMI and 48 with NSTEMI , 73 were hyponatremic (S-Na <135 mEq/L) and 27 were normonatremic (S>or=135 mEq/L). Patients who had hyponatremia were more likely to die or have recurrent myocardial infarction in the next 30 days (p <0.05). On multivariate analysis , hyponatremia was a strong predictor of adverse outcome (odds ratio 2.4, 95% confidence interval). The authors concluded that hyponatremia is associated with 30-days adverse outcome in patients presenting with acute coronary syndrome..

A paper looked at the association between Nutritional Status using the Mini Nutritional Assessment and the severity of Pressure Ulcer in Elderly Hospitalized Patients at King Abdul-Aziz Medical City in Riyadh. The authors followed a cross sectional study using pre-post test which included thirty five elderly patients newly diagnosed with PU admitted at KAMC. Nutritional status and PU was assessed at baseline and after two months at the end. Anthropometric measurements taken and blood samples collected to analyze albumin, blood urea nitrogen (BUN), creatinine, before and after two months. the results showed that 88.6% of PU patients were malnourished or at risk of malnutrition at baseline using the MNA test, and there were a reduction in the MNA score with the severity of PU. The MNA score was significantly increased at post study, and 54.3% of the subjects were healed completely from PU at the end. The results showed that all patients classified as normal nutritional status were completely healed from PU, 79% of at risk of malnutrition were completely healed, while only 24% of malnourished were completely healed. The result showed that there was a significant negative correlation between MNA score and age. There were significant positive

correlations between MNA score and BMI, CC, MAC and albumin at baseline. The authors concluded that the results indicated that the severity of PU in elderly subjects is affected by nutritional status using MNA score. Thus, optimizing diet may help in treating and reducing the severity of PU in elderly subjects. This should be an integral part of any PU management.

A paper from Doha that was part of thesis toward the fulfilment of the master in Geriatric and Gerontology. The author study the situation of urinary tract infection in home care.

Urinary tract infection is a very common problem in general practice, but it is more prominence in elderly patients and its average prevalence is 25-40%. A retrospective study at homecare residents was between September 2010 to September 2011 where the medical records and files of all patients were reviewed. 132 patients of the total residents(614) had got UTIs within a period of study. One hundred and thirty two had growth of microorganism . Most of them was single organism (80% of the growth is due to a single organism) ,but about more than 50% associated with bacteria in the urine Usually more than 100,000 organisms per ml. The most common causative organism it was E.COLI(57 patients) i.e 42.5% of total patients who are suffered of UTI . The author concluded that Asymptomatic bacteriuria is common in elderly patients, and that it is more common in women.

A paper from Dubai looked at Health Care Services utilization and satisfaction among elderly in Dubai, UAE and some Associated Determinants. The author stressed that Planning and utilization of health services in elderly group is very important concern for both elderly as well as health care services providers. A cross sectional study was carried out in primary health care facilities at Dubai health authority , United Arab Emirates among elderly (aged 65 years or more) similar to the most developed world countries which accepted the chronological age of 65 years as a definition of elderly. Sample size estimation through Utilizing EPI_INFO “6.04”, applying certain criteria was (384) participant both males and females. Sample type was Stratified random sample with proportional allocation. The study has revealed that Elderly having not enough income were more liable to be high utilizers of services as compared to those having enough and more than save income (OR= 0.32; CI: 0.14-0.74). Elderly with IHD and those with osteoporosis were significantly more liable to be high utilizers of services as compared those without these diseases (OR= 0.56; CI: 0.32-0.97 and OR= 0.36; CI: 0.16-0.79 respectively). The study showed that lower utilizers of these services were significantly more satisfied than high utilizers (P<0.05). On the other hand, there was no statistically significant association between utilization of services and other items of satisfaction score. The study showed that satisfaction with services is correlated to the income (OR= 0.24; CI: 0.20-0.88) However, the association was not statistically significant (OR= 0.82; CI: 0.29-2.31). The authors concluded that the majority of the elderly at the primary health care centres were low utilizes (Less than once/month) of services. The significant determinants of being less very satisfied about the services provided were being illiterate or with an educational level less than secondary school, having osteoporosis

The Association between Nutritional Status using the Mini Nutritional Assessment and the severity of Pressure Ulcer in Elderly Hospitalized Patients at King Abdul-Aziz Medical City in Riyadh

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ABSTRACT

Introduction: Pressure Ulcer (PU) is a localized injury to the skin and/or underlying tissue. Malnutrition correlates with PU and is one of the main factors for PU development. Mini Nutritional Assessment (MNA) has been designed and validated by previous workers to provide a single, rapid assessment of nutritional status in elderly patients, which classified patients into normal nutritional status, at risk of malnutrition, or malnourished.

Objectives: Investigate the relationship between nutritional status and PU and the possibility of using the MNA to predict pressure ulcer outcomes. The main aim is to investigate the relationship between nutritional status using MNA and PU in elderly hospitalized patients at King Abdul-Aziz Medical City in Riyadh (KAMC).

Methods: The study is a cross sectional study using pre-post test which included thirty five elderly patients newly diagnosed with PU admitted at KAMC. Nutritional status and PU was assessed at baseline and after two months at the end. Anthropometric measurements were taken and blood samples collected to analyze albumin, blood urea nitrogen (BUN), creatinine, before and after two months.

Results: The results showed that 88.6% of PU patients were malnourished or at risk of malnutrition at baseline using the MNA test, and there was a reduction in the MNA score with the severity of PU. The MNA score was significantly increased at post study, and 54.3% of the subjects were healed completely from PU at the end. The results showed that all patients classified as normal nutritional status were completely healed from PU, 79% of at risk of malnutrition were completely healed, while only 24% of malnourished were completely healed. The result showed that there was a significant negative correlation between MNA score and age. There were significant positive correlations between MNA score and BMI, CC, MAC and albumin at baseline.

Conclusion: To conclude, the results indicated that the severity of PU in elderly subjects is affected by nutritional status using MNA score. Thus, optimizing diet may help in treating and reducing the severity of PU in elderly subjects. This should be an integral part of any PU management.

Key words: Mini Nutritional Assessment, Pressure ulcer, Malnutrition, Elderly

Introduction

In recent years, there has been a sharp increase in the number of older persons worldwide [1] and more older people are alive nowadays than at any time in the past [2]. The proportion of the population aged 60 and over, is also growing each year. By the year 2025, the world will host 1.2 billion people aged 60 and over and that is expected to rise to 1.9 billion in 2050 [3]. The same trend is also predicted in the Eastern Mediterranean Region; while the proportion of the elderly population to total population was 5.8 % in 2000 it is expected to reach 8.7 % by the year 2025 and 15 % by 2050 [4].

The proportion of people who are 60 years of age and older in the Saudi population is 5.2% [5]. The proportion of elderly subjects is expected to increase to 8.6% by 2025 and 18.6% by the year 2050 [6].

Pressure ulcer (PU) is a localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction [7]. The prevalence of multiple illnesses among the elderly people is usually increasing. Many workers predict that this could lead to a considerable increase in PU [8].

PU occurs in both hospital and community settings, often in the elderly and/or immobile people with severe acute illness and in those with neurological deficits. An increasing elderly population with growing number of multiple illnesses is being seen in western society [9].

Malnutrition correlates to PU. Patients with PU or who are vulnerable to PU have a significantly lower energy intake than other patients not suffering from PU [10-11]. Malnutrition is one of the well-known factors for PU development in hospitals and nursing homes [12-13].

The Mini Nutritional Assessment (MNA) has recently been designed and validated to provide a single, rapid assessment of nutritional status in elderly patients in outpatient clinics, hospitals, and nursing homes. It has been translated into several languages and validated in many clinics around the world [14]. The MNA provides a simple, noninvasive, and well-validated nutrition screening tool that can quickly and easily identify older adults who are at risk of malnutrition. It is targeted at those living in the community, long-term care facilities, or nursing homes and those who require social services and those coming to acute care units. The MNA has been used and validated in all these above mentioned settings. In both medical practice and clinical research, the reliability, ease of use, and effectiveness of the MNA have made it widely acceptable for nutrition screening and assessment of elderly people [14-15]. The MNA has become a vital component of comprehensive geriatric assessment [14].

In this study, the association between nutritional status using the MNA and the severity of PU in elderly hospitalized patients at King Abdul-Aziz Medical City (KAMC) in Riyadh was studied. According to the best of our Knowledge, we haven't found any published study investigate the association between MNA score and the severity of PU. The results will draw attention on the possibility of using the MNA score to predict PU outcome.

Rationale and Objective

Nutritional status has been correlated with the development and healing of PU. Thus, the association between MNA and the severity of PU in elderly patients would draw attention to the possibility of using the MNA to predict PU outcome. Therefore, the main aim is to investigate the relationship between MNA score and PU in elderly hospitalized patients at KAMC in Riyadh.

Methodology

Study design and site

The study was a cross sectional study using pre post test, in which nutritional status and PU were assessed at admission (baseline) and after two months of including the elderly patients newly diagnosed with PU, admitted at KAMC in Riyadh, Kingdom of Saudi Arabia.

This study was approved from three scientific committees; Deanship of postgraduate at King Saud University, King Abdullah International Medical Research Center (KAIMRC), and King Abdulaziz City for Science and Technology (KACST) and was funded by KACST.

Study sample and objects

All elderly (≥ 60 years old) patients newly diagnosed with PU admitted at geriatric unit and/or long term care units (Wards 22, 23, 24 and 25) at KAMC in Riyadh are included in the study. Forty four newly admitted elderly patients were the study sample for a period of ten months (from May 2011 to March 2012) in which 9 patients passed away. Thirty five patients continued in this study in which 15 subjects were female and 20 subjects were male and their mean age was 79.2 years \pm 11.3.

Stages and healing of pressure ulcer

PU status was assessed at the next day of admission by a thorough visual skin assessment conducted by wound team with a large practice specializing in the diagnosis and treatment of PU. Wounds team consists of a dermatologist, plastic surgeon, wound care nurse and elderly care nurse. On the basis of the skin assessment, wounds team recorded the characteristics (including stage) of all PUs observed. Patients were also categorized based on the presence and stage of PU.

The PU was assessed using the staging system of National Pressure Ulcer Advisory Panel (www.npuap.org) [7] at baseline. This scale is used widely for clinical evaluation of PU and it has been recommended to guide the assessment of PU [7].

To assess the healing status of PU after two months at the end of the study we didn't use the PU score to measure the improvement of PU status but we used the healing classification (completely healed and not completely healed).

Nutritional status

Nutritional status of elderly PU patients was screened and assessed at admission and after two months at the end of the study at KAMC in Riyadh. Dietitians in KAMC in Riyadh assess weight status for each individual to determine weight history and significant weight loss from usual body weight, assess ability to eat independently, and assess adequacy of total food and fluid intake.

Mini Nutritional Assessment (MNA)

Nutritional status of elderly patients was assessed using the MNA. MNA were mostly filled in by watchers of patients (relatives or hospital caregivers) and some were done by the patients.

The MNA scale (0-30 points) consisting of 18 point-weighted questions, is composed of anthropometric measurements, global assessment, dietary questionnaires and subjective assessment. The answers were given a maximum of 30 points. Depending on the score of the test, elderly subjects involved in the study were classified into the following categories: well-nourished [MNA points 24-30], at risk of malnutrition [MNA points 17-23.5], and malnourished [MNA < 17 points] [16].

Anthropometric measurement

Measurements of weight and height were measured by the nurses at time of admission and after two months at the end of the study. Midarm circumference (MAC) and Calf circumference (CC) were measured by the researcher on the next day of admission and after two months at the end of the study.

Measurements of weight (to the nearest 0.1 kg) and height (to the nearest 0.1 cm) were made using a portable scale and a portable stadiometer, respectively. Knee height was used to estimate the stature of a person who could not stand, or for a person with an obvious spinal curvature. The following equation was used to estimate the stature from knee height; Stature for elderly = [(2.02 knee height) - (0.24 age)]. BMI was calculated by dividing the weight in kilograms by the square of the stature in meters (kg/m²). MAC was taken on the front of the non-dominant upper arm by measuring the halfway distance between the inferior aspect of the acromion and the olecranon. MAC was measured to the nearest 0.1 cm using a flexible non-elastic tape. CC was taken while the elderly patient was laid supine, and the left knee and ankle were bent to a 90° angle. CC measurement was taken with an insertion measuring tape. The loop of the tape is moved up and down the calf to locate the largest diameter, and the measurement was recorded to the nearest 0.1cm [17].

Biochemical indicators

Blood samples were collected by nurses at 9 a.m. and processed for serum albumin, urea nitrogen (BUN), and creatinine. A total of 5 ml of blood was drawn from each subject. Blood samples were then centrifuged at 3500 r.p.m for 10 minutes in a refrigerated centrifuge to separate serum samples from the cells. Serum samples were stored at 22° C in plastic tubes until analysis. All samples were measured at central lab of KAMC in Riyadh.

BUN concentration was measured by urease and creatinine concentration was measured by kinetic alkaline pictrate methods. Serum albumin was determined by the spectrophotometric bromocresol green method. The following values were considered normal: albumin >35g/L; BUN 3.0 to 7.0mmol/L; serum creatinine 40 to 110µmol/L [18].

Nutritional Management for PU:

The nutritional status for elderly subjects with PU was screen and assess at admission. They refer all individuals with PUs to dietitians in KAMC in Riyadh for early assessment and intervention of nutritional problems.

Dietitians in KAMC in Riyadh provide sufficient calories (30 kcal to 40 kcal per kg of body weight per day or Harris-Benedict times stress factor (1.2 for stage 1 and stage 2 ulcer, 1.5 for stage 3 and stage 4 PU). They adjust calorie based on weight loss, weight gain, or level of obesity. They provide adequate protein for positive nitrogen balance of individuals with PU (1.2g to 1.5g of protein/kg bw/d (stage 1 and stage 2 PU), 1.5g to 2.0g of protein/kg bw/d (stage 3 and stage 4 PU)). However the hospital does not use any standard nutritional assessment specialized for elderly such as MNA, subjective global nutritional assessment, or malnutrition universal screening test to evaluate nutritional status for elderly patients

Results

The mean body weight, BMI, CC, and MAC were higher at post study compared to baseline (Table 1). Albumin value at post study was higher than at baseline (Table 1). The results show that there were no statistical differences in the other biochemical measurements. The mean of MNA score was 12.4. However, at post study, the mean of MNA score was increased significantly to 15.8 (Table 1 - next page).

The results show that 57.2% of elderly patients were in stages 3 and 4 of PU at baseline, when they were admitted to hospital. There were 54.3% healed completely at the end of two months; 45.7% were not completely healed (Table 2 - next page).

Correlation between Pressure Ulcer Score and Mini Nutritional Assessment Score at baseline

The results show that there is a significant negative correlation between PU score and MNA score (Table 3 - page 7).

Classification of nutritional status of subjects

Based on the MNA Score, it was found that 88.6% of the patients were malnourished or at risk of malnutrition at baseline. The percentage of the subjects classified as malnourished at baseline decreased from 74.3% to about 48.6% at post study (Table 4 - page 7).

Classification of nutritional status

The results show that most (69%) of malnourished patients are at stage 4 and stage 3 of PU score at baseline (Table 5).

The results show that all patients classified as normal nutritional status were healed, 79% of at risk of malnutrition were healed and only 24% of malnourished subjects were completely healed (Table 5).

Table 1: Anthropometric, biochemical measurements, and MNA score of subjects at baseline and post study

Parameter	M ±SD		P Value*
	Baseline	Post study	
Body weight (kg)	57.6±15.9	58.3±15.7	0.001
BMI (kg/m ²)	22.2±5.4	22.5±5.3	0.002
CC (cm)	30.3±2.2	30.4±2.1	0.003
MAC (cm)	21.3±1.8	21.5±1.9	0.002
Albumin (g/l)	28.9 ± 4.10	31.6 ± 3.70	0.0001
BUN (mmol/l)	11.0 ± 7.70	10.9 ± 8.50	0.975
Creatinine (µmol/l)	93.0 ± 71.8	92.6 ± 76.8	0.949
MNA score	12.4 ± 6.5	15.8 ± 7.2	< 0.0001

*Paired t test; P < 0.05 considered statistically significant. M: mean. SD: standard deviation.

BMI: body mass index, CC: calf circumference, MAC: mid-arm circumference, BUN: blood urea nitrogen, MNA: Mini Nutritional Assessment.

Table 2: Classification of pressure ulcer status (healing status) of subjects at post study according to pressure ulcer stage at baseline

PU stage (baseline)	PU status (post study)		
	Completely healed N(%)	Not completely healed N(%)	Total N(%)
Stage 1	3(75)	1(25)	4(11.4)
Stage 2	10(90.9)	1(9.1)	11(31.4)
Stage 3	5(62.5)	3(37.5)	8(22.9)
Stage 4	1(8.33)	11(91.7)	12(34.3)
Total	19(54.3)	16(45.7)	35(100)

PU: Pressure Ulcer. N: number of cases. (%): percent.

Table 3: Correlation between Pressure Ulcer Score and Mini Nutritional Assessment Score at baseline

Correlation between pressure ulcer score and mini nutritional assessment score	R	P Value
	-0.403	0.016

R: Pearson correlation; P < 0.05 considered statistically significant

Table 4: Classification of nutritional status of subjects at baseline and post study

Classification of nutritional status	Baseline	Post study	P value
	N (%)	N (%)	
Normal nutritional status	4 (11.4)	4 (11.4)	0.005
At risk of malnutrition	5 (14.3)	14 (40.0)	
Malnourished	26 (74.3)	17 (48.6)	

N: number of cases. (%): percent. *Paired t test; P < 0.05 considered statistically significant.

Table 5: Classification of nutritional status in relation to pressure ulcer stages at baseline

Classification of nutritional status	PU stages (baseline)				PU status (post study)	
	Stage 1 N(%)	Stage 2 N(%)	Stage 3 N(%)	Stage 4 N(%)	Completely healed N (%)	Not completely healed N (%)
Normal nutritional status	1(25)	2(50)	1(25)	0 (0.0)	4 (100)	0 (0.0)
At risk of malnutrition	1(20)	3(60)	1(20)	0 (0.0)	11 (79)	3 (21)
Malnourished	2(8)	6(23)	6(23)	12(46)	4 (24)	13(76)

PU: Pressure Ulcer. N: number of cases. (%): percent.

Mini nutritional assessment score and albumin

The results show that there was a reduction in the MNA score and serum albumin with the severity of PU (Table 6 - next page).

The results show that completely healed patients had higher MNA score and albumin than not completely healed (Table 7 - next page).

Table 6: Comparison between MNA score and PU stages and between albumin and PU stages at baseline

PU Stages (baseline)	MNA score (baseline) M± SD	Albumin (baseline) M± SD
Stage 1	20.00 ± 5.07 ^a	33.0 ± 1.0 ^a
Stage 2	14.68 ± 5.7 ^{ab}	30.9 ± 2.3 ^a
Stage 3	11.90 ± 7.5 ^{bc}	28.9 ± 4.3 ^{bc}
Stage 4	09.30 ± 4.7 ^c	28.9 ± 3.8 ^{bc}

PU: Pressure Ulcer, MNA: Mini Nutritional Assessment. M: mean. SD: standard deviation. Means with different letter superscript are differ significantly. Oneway Anova Test-Post Hoc Tests; P < 0.05 considered statistically significant.

Table 7: Comparison between MNA score and PU status and between albumin and PU stages at post study

PU status (post study)	MNA score (post study) M± SD	Albumin (post study) M± SD
Completely healed	19.97±5.3 ^a	33.2 ± 3.8 ^a
Not completely healed	11.133±5.7 ^b	29.6± 2.44 ^b

PU: Pressure Ulcer. MNA: Mini Nutritional Assessment. M: mean. SD: standard deviation. Means with different letter superscript are differ significantly. Oneway Anova Test-Post Hoc Tests; P < 0.05 considered statistically significant.

Classification of nutritional status and albumin

The results show that there was a reduction in the serum albumin in all MNA groups and malnourished patients had lower serum albumin level (Table 8).

Table 8: Classification of nutritional status in relation to albumin at baseline

Classification of nutritional status	Albumin (baseline) M± SD	Albumin (post study) M± SD
Normal nutritional status	34.00 ± 1.15 ^a	36.50 ± 1.9 ^a
At risk of malnutrition	32.00 ± 2.80 ^a	31.70 ± 3.7 ^b
Malnourished	27.48 ± 3.60 ^b	30.30 ± 3.2 ^b

M: mean. SD: standard deviation. Means with different letter superscript are differ significantly. Oneway Anova Test-Post Hoc Tests; P < 0.05 considered statistically significant.

Albumin and age

The results show that serum albumin had significant negative correlation with advancing age and positive correlation with BMI in PU elderly patients (Table 9).

Table 9: Correlation of albumin with age and BMI at baseline

Parameters	Albumin	
	R	P value
Age	-0.422	0.013
BMI	0.394	0.021

BMI: body mass index.

R :Pearson correlation;

P < 0.05 considered statistically significant.

Correlation between mini nutritional assessment score and age, anthropometric and biochemical measurements

The results show that there were significant negative correlations between MNA score and age and between MNA score and BUN at baseline. There were significant positive correlations between MNA score and BMI, CC, MAC and albumin at baseline (Table 10). No significant correlation was found between MNA score and creatinine.

Table 10: Correlation between mini nutritional assessment score and various parameters at baseline

Parameters	MNA score	
	R	P value
Age	-0.518	0.002
BMI	0.420	0.014
CC	0.396	0.021
MAC	0.401	0.019
Albumin	0.507	0.002
BUN	-0.358	0.038
Creatinine	-0.005	0.976

MNA: mini nutritional assessment. BMI: body mass index, CC: calf circumference, MAC: mid-arm circumference, BUN: blood urea nitrogen. R: Pearson correlation; P < 0.05 considered statistically significant.

The correlation between MNA score and these parameters were tested at post study and we found the same results as at the baseline except BUN in which there is no significant correlation found with MNA score at post study (data not shown).

Discussion and Conclusions

In the present study, we investigate the nutritional status of elderly subjects using the MNA score in PU patients at KAMC in Riyadh.

The results show that there was a reduction in the MNA score with the severity of PU which may indicate that PU is affected by nutritional status (Table 6). This is accompanied by improvements in MNA score in which 34.6% of malnourished patients at baseline moved to at risk of malnutrition at post study (Table 4). The results show that all patients classified as normal nutritional status were completely healed, 79% of at risk of malnutrition were completely healed, and only 24% of malnourished were completely healed (Table 5). This may indicate that nutritional intervention in addition to other medical care has a role in improving PU status of the elderly subjects at KAMC in Riyadh.

Wissing and Unosson (1999) showed that in free-living elders with leg ulcers of any cause, (46%) and (3%) were at risk of malnutrition and malnourished, respectively [19]. Other studies show that more than 80% of PU elderly patients were classified as at risk of malnutrition or malnourished using MNA score [18-20]. This was consistent with our study in which 88.6% of PU patients were malnourished or at risk of malnutrition at baseline (Table 4). Because malnutrition is one of the main factors of developing PU, it is not a surprise in our study that about 88% of the subjects were at risk of malnutrition or malnourished.

Hudgens et al (2004) show that subjects classified as well nourished had a median stage 2 PU, whereas those classified as at risk and malnourished had a median stage 3 and stage 4, respectively [20]. In our study the median stage of subjects classified as well nourished or at risk of malnutrition is stage 2 PU, whereas those classified as malnourished had a median stage 3. This is accompanied by a significant negative correlation between MNA score and PU score in our study. This may be an indication that MNA test can be used to predict the severity of PU.

Wissing et al (2001) show that MNA score increased over time in healed PU subjects. This suggests that improving MNA score is an indication of an enhanced wound healing process[21]. This was consistent with our study in which the MNA score was significantly increased at post study compared to baseline (Table 1), and 54.3% of the subjects were healed completely (Table 2).

Fifty percent to 70% of PU healed completely after nonsurgical intervention has been applied [22]. Berlowitz and Wilking (1990) show that 40% of PU patients completely healed during a 6-week follow-up period [23]. In addition they show that nutritional intervention and medical care resulted in healing of 65% of stage II ulcers, 14% of stage III ulcers, and 0% of stage IV ulcers over a 6-week follow up period [23]. This was consistent with our study (see Table 2).

Hudgens et al (2004) show that serum albumin was low in all 3 MNA groups in PU patients who lived in an elders nursing home [20]. In another study patients with MNA \geq 17 usually

have a low albumin level [14]. This is consistent with our study in which serum albumin was below normal range in all 3 MNA groups (Table 8). Previous studies demonstrated that serum albumin levels were lower in patients with PU compared with those without PU [24], and was able to predict PU development with adequate validity [25]. This is consistent with Bonnefoy et al's (1995) study, that found that wound severity can be influenced by albumin levels in patients with PU [26]. In our study, the results show that there was a reduction in the serum albumin level with the severity of PU which indicates that PU may be affected by nutritional status (Table 6). Furthermore the decrease in the level of serum albumin could be due to inflammation that is associated with PU. This is because albumin is one of the negative acute phase proteins that decrease with inflammation.

Serum albumin level has been traditionally considered as a marker for PU healing [27] and also may be associated with PU healing [28]. This is consistent with our study in which the results show that completely healed patients have higher serum albumin level than those not completely healed (Table 7).

MNA score correlated with albumin level in elderly patients [29-30]. In a residential home for the elderly, Salva et al (1996) found that levels of serum albumin level were highly correlated with the MNA score [31]. In our study the MNA score correlates positively with serum albumin level (Table 10).

The result shows that the MNA score correlated positively with BMI, CC, and MAC (Table 10). This was consistent with Langkamp Henken et al's (2005) study in which they found that the MNA score correlated positively with anthropometric measures including BMI, MAC and CC [18]. In a previous study show that levels of BMI were highly correlated with the MNA score [31].

Shahin et al's (2010) study show a significant relationship between the presence of PU in hospitals and undesired weight loss [32], and weight loss were highly correlated with the MNA score [31]. In our study, we found a significant increase in BMI at post study (Table 1). This increase in BMI may play a role in the healing process of PU.

Desneves et al (2005) found that PU patients who received high caloric diet and supplementation of vitamins and minerals noted a 2.5 fold greater improvement in healing than PU patients who received regular diet [33]. A study conducted by Wilson and his colleagues (2002) indicate that individuals who consumed oral nutritional supplements (protein, calories, fat, vitamins, minerals and/or amino acids) between meals accelerate the healing of PU [34]. In a study of 12 enterally fed patients with PU, the group who received 1.8 g/kg of protein had a greater decrease in PU surface area than the group receiving 1.2 g/kg of protein (the current recommended daily allowance) [35]. This was consistent with our study (MNA questionnaires) that there was increase in food intake (protein, vegetables and fruits, and fluids). This was accompanied by improvement of PU status in which 54.3 % were completely healed and 45.7% were not completely healed (Table 2).

Using MNA, the subjects who consume at least one serving of dairy products (such as milk, cheese, yoghurt) per day and two or more serving of legumes or eggs per week and meat, fish or poultry every day increased from 48.6% at baseline to 62.9% at post study. This increase in protein intake may have a role in the increase in albumin level at post study and in the healing process of PU.

To conclude, the results indicate that the severity of PU in elderly patients is affected by nutritional status using MNA score. Diet may help in treating and reducing the severity of PU in elderly subjects as shown by the increase in protein intake and by the increase in BMI and in the concentration of albumin level, which is commonly used as indication of the nutritional status.

Recommendations

Serial assessments of elderly PU patients using the MNA are recommended so that we can monitor the effectiveness of nutrition interventions.

Performing nutritional screening and assessment is important, but nutrition intervention should be adapted when patients are identified as malnourished or at risk of malnutrition.

Nutrition assessments and interventions must be documented so that the entire healthcare team is aware of the patient's nutrition goals.

There was minimal information and limited studies in the area of what nutritional intervention should be implemented to reduce the risk of developing malnutrition in PU patients, further studies are needed in this area.

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Prognostic value of hyponatremia in elderly Patients with Acute Coronary Syndrome

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ABSTRACT

Objectives: to analyse in-hospital outcomes and prognostic implications of reduced sodium serum level (S-Na) in patients with acute coronary syndrome including ST elevation myocardial infarction (STEMI) and non ST elevation myocardial infarction (non-STEMI).

Design: A cross sectional study was conducted on elderly patients.

Participants: One hundred patients aged ≥ 60 years, both males and females.

Setting: Participants were recruited from cardiology intensive care unit in Ain Shams University hospitals.

Measurements: All patients had a sodium level determined at time of admission and after 48 hours, serial ECG and cardiac enzymes (creatine phosphokinase (CPK) and CPK-MB fraction) levels.

Results: Of 100 patients, 52 patients were admitted with STEMI and 48 with NSTEMI; 73 were hyponatremic (S-Na <135 mEq/L) and 27 were normonatremic (S-Na ≥ 135 mEq/L). Patients who had hyponatremia were more likely to die or have recurrent myocardial infarction in the next 30 days ($p < 0.05$). Hyponatremia, hypotension on admission, left ventricular ejection fraction (EF), mean level of cardiac enzymes were significantly associated with adverse outcome. On multivariate analysis, hyponatremia was a strong predictor of adverse outcome (odds ratio 2.4, 95% confidence interval).

In conclusion, hyponatremia is associated with 30-days adverse outcome in patients presenting with acute coronary syndrome.

Key words: hyponatremia; acute coronary syndrome; elderly;

Introduction

Hyponatremia, defined as a serum sodium concentration of <135 mmol/L, is the most common electrolyte abnormality in hospitalized patients (1,2). Hyponatremia often signifies poor prognosis(3). It is a predictor of mortality in patients with heart failure (4,5) and in patients with ST-elevation myocardial infarction (STEMI) (6,7). There is complex neuro-hormonal activation in acute myocardial infarction related to activation of the renin-angiotensin system, release of atrial natriuretic peptide and catecholamines (8,9). These mechanisms are similar to those in heart failure and lead to peripheral vasoconstriction and myocardial hypertrophy, with potential to worsen survival in acute myocardial infarction. The fall in sodium concentrations in patients with acute myocardial infarction is related to the previous mechanisms (6,10). While the prognostic value of hyponatremia in chronic heart failure is well established, data on the prognostic importance of hyponatremia in the setting of acute myocardial infarction are lacking, also few studies have focused on outcome in the elderly age group. This study is being undertaken to determine the prognostic significance of hyponatremia in the setting of acute coronary syndrome and to determine its usefulness in predicting short term (30-days) adverse outcomes.

Subjects and Methods

A cross sectional study was conducted on one hundred elderly males and females. Participants were recruited from cardiology intensive care unit in Ain Shams University hospitals. Elderly with the diagnosis of acute STEMI and non-STEMI were included. During the hospital stay, all participants underwent comprehensive geriatric assessment, medication review, cognitive assessment by which delirious patients were excluded, also subjects with history of heart failure, renal failure and hepatic patients were excluded; patients with history of diuretic use were also excluded.

Patients had clinical examination done and investigations in the form of serial ECG and cardiac enzymes, Echocardiography, laboratorial investigations for assessment of other Co- morbidities as complete blood picture, lipid profile, renal functions and blood glucose levels, also all participants had serum sodium levels obtained on admission and at 48 hours.

Laboratorial investigations were collected from medical reports. Diagnosis of myocardial infarction was done according to the criteria of the Joint European Society of Cardiology and American College of Cardiology in which diagnosis requires a finding of the typical rise and fall of biochemical markers of myocardial necrosis in addition to at least 1 of the following (11):

- o Ischemic symptoms
- o Development of pathologic Q waves
- o Ischemic ST-segment changes on electrocardiogram (ECG) or in the setting of a coronary intervention

Renal insufficiency and anemia were defined as admission values for creatinine >1.4 mg/dl and <12 mg/dl for hemoglobin, respectively. The follow-up for myocardial infarction recurrence and mortality was done through post discharge phone calls and the follow up duration was 30 days.

Statistical methods:

The collected data were coded, tabulated, revised and statistically analyzed using SPSS program (version 20). Descriptive statistics were done using mean and standard deviation for numerical parametric data and by number and percentage for categorical data. Statistical analysis was done for quantitative variables by using independent t-test in case of two independent groups, and paired t-test in related samples with parametric data. Chi-square test was used for non parametric data and Logistic regression analysis for predictors of mortality. The level of significance was taken at P value < 0.05.

Results

Baseline sociodemographic and clinical Characteristics of Patients are shown in Table 1 - next page.

There is no statistically significant difference between Na level on admission and after 48 hours as shown in Table 2 - page 15.

Comparison between hyponatremic and normonatremic groups shows no statistically significant difference between the two groups as regards sociodemographic variables, Co morbidities (diabetes, hypertension, anemia, renal impairment or hypercholesterolemia or old stroke), presence of hypotension on admission, pulmonary edema on admission or type of myocardial infarction, while ejection fraction was significantly lower in the hyponatremic group (Table 3).

Relation between baseline patients' characteristics and outcome is demonstrated in Table 4, which shows that both hypotension on admission and hyponatremia are significantly associated with poor outcome (mortality, MI recurrence).

Significant relation between poor outcome, EF, cardiac enzymes and sodium level on admission is shown in Table 5.

Significant clinical variables were entered into a multivariate regression model which showed that hypotension on admission and hyponatremia are each significantly associated with 30-days adverse outcomes (Table 6).

Discussion

The results of this cross sectional study demonstrated that hyponatremia is common in elderly patients presenting with acute coronary syndrome and that hypotension on admission and hyponatremia were each significantly associated with recurrent myocardial infarction or death within 30 days of hospitalization.

Reviewing literature, data from several studies support the present study results. Flear et al (12) reported that hyponatremia, hypochloremia, and uremia were common in patients with confirmed myocardial infarction, with higher in-hospital mortality in hyponatremic patients, also Hochman et al (13) reported that hyponatremia in these patients was correlated with higher mortality and reflected severity of underlying disease; another study by Goldberg et al (7) showed an association between hyponatremia and increased 30-days mortality in patients with STEMI.

Bogdan et al (14) reported a high prevalence of hyponatremia within the first 72 hours of transmural myocardial infarction and Klotkowski et al (15) reported that patients with acute myocardial infarction developed hyponatremia on admission or within the first 48 after admission.

In this study age, sex, smoking, diabetes, hypertension, anemia, renal impairment, hypercholesterolemia, and pulmonary edema on admission were not associated with death/myocardial infarction. On the other hand hypotension on admission, hyponatremia on admission, ejection fraction and CPK & CPK-MB levels were significantly associated with recurrent myocardial infarction and death within 30 days and that is agreed with by Qing Tang & Qi Hua (16) who reported that gender, diabetes, hypertension, renal insufficiency, and hyperglycemia were not significantly associated with inhospital mortality and also with Singla et al (10) who reported that hypotension on admission and hyponatremia on admission were each significantly associated with the primary end point (combined incidence of death or new myocardial infarction within 30 days of index hospitalization), while diabetes mellitus and hypertension were not associated with death/myocardial infarction.

Qing Tang & Qi Hua (16) observed that patients with hyponatremia had lower ejection fractions than those without and stated that large infarct size resulted in ventricular dysfunction and might be responsible for these adverse outcomes therefore hyponatremia may be a simple parameter which reflects the presence of heart failure and that was in agreement with our study results as well.

Finally, it can be concluded that hyponatremia is considered a strong predictor for poor short term outcome in elderly with acute coronary syndrome.

Study limitations :

Our study has some limitations. Importantly, this was a small single site observational study also patients with hyperglycemia were not excluded which may be a contributing factor for hyponatremia.

Conclusion

Hyponatremia is associated with 30days adverse outcome in patients presenting with acute coronary syndrome.

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Age Range	60-79	
Mean±SD	63.42±5.02	
Sex	N	%
Female	68	68.0
Male	32	32.0
Smoking		
Current	49	49.0
Ex-smoker	25	25.0
Non smoker	26	26.0
Diabetes	46	46.0
Hypertension	64	64.0
Other comorbidities		
Anemia	6	6.0
Renal impairment	17	17.0
Hyper cholesterolemia	6	6.0
Stroke	7	7.0
MI		
ST	52	52.0
NST	48	48.0
Hypotension on admission	10	10.0
Pulmonary edema on admission	1	1.0
Hyponatremic patients	73	73.0
Normonatremic patients	27	27.0
Outcome		
Mortality	16	16.0
MI recurrence	14	14.0
Good prognosis	70	70.0
EF		
Range	15-77	
Mean±SD	46.440±12.802	
Peak CPK		
Range	200-2850	
Mean±SD	813.0±690.1	
MB		
Range	41-1820	
Mean±SD	176.85±307.27	

Table 1 : Baseline Characteristics of Patients

				Paired	Paired Samples Test		
		Range		Mean(± SD)	Mean (SD)	t	P-value
Na on admission	111.000	-	152.000	131.060 (± 7.393)	0.430 (5.360)	0.802	0.424
Na after	111.000	-	153.000	130.630 (± 6.932)			

Table 2: Sodium levels at different time points

		Groups						Chi-Square	
		Hyponatremia		Normonatremic		Total		X ²	P-value
		N	%	N	%	N	%		
SEX	Female	50	68.49	18	66.67	68	68.0	0.030	0.862
	Male	23	31.51	9	33.33	32	32.0		
SMOKING	Current	38	52.05	11	40.74	49	49.0	1.293	0.524
	Ex-smoker	18	24.66	7	25.93	25	25.0		
	Non smoker	17	23.29	9	33.33	26	26.0		
	Diabetes	32	43.84	14	51.85	46	46.0	0.510	0.475
	Hypertension	45	61.64	19	70.37	64	64.0	0.651	0.420
Other comorbidities	Anemia	3	4.11	3	11.11	6	6.0	2.267	0.686
	Renal impairment	13	17.81	4	14.81	17	17.0		
	Hypercholesterolemia.	4	5.48	2	7.41	6	6.0		
	Old Stroke	6	8.22	3	11.11	9	9.0		
MI	ST	39	53.42	13	48.15	52	52.0	0.220	0.639
	NST	34	46.58	14	51.85	48	48.0		
	Hypotension on admission	8	10.96	2	7.41	10	10.0	0.292	0.589
	Pulmonary edema on admission	1	1.37			1	1.0	0.633	0.426
								t	P-value
AGE	Mean±SD	63.356±5.012		63.593±5.116				-0.208	0.835
EF	Mean±SD	44.822±12.480		50.815±12.863				-2.114	0.037*
CPK	Mean±SD	795.562±685.520		860.222±713.587				-0.414	0.680
MB	Mean±SD	145.685±219.976		261.111±464.119				-1.683	0.096

Table 3: Comparison between hyponatremic and normonatremic groups as regard sociodemographic and clinical variables

		Outcome						Chi-Square	
		Poor		Good		Total		X ²	P-value
		N	%	N	%	N	%		
SEX	Female	22	73.33	46	65.71	68	68.0	0.560	0.454
	Male	8	26.67	24	34.29	32	32.0		
SMOKING	Current	16	53.33	33	47.14	49	49.0	2.029	0.363
	Ex-smoker	9	30.00	16	22.86	25	25.0		
	Non smoker	5	16.67	21	30.00	26	26.0		
Hyponatremic patients		28	93.33	45	64.29	73	73.0	7.577	0.005*
Normonatremic patients		2	6.67	25	35.71	27	27.0		
Diabetic		13	43.33	33	47.14	46	46.0	0.123	0.726
Hypertensive		19	63.33	45	64.29	64	64.0	0.008	0.928
Other comorbidities	Anemia	1	3.33	5	7.14	6	6.0	8.520	0.074
	Renal impairment	10	33.33	7	10.00	17	17.0		
	Hyper cholesterolemia	2	6.67	4	5.71	6	6.0		
	Old Stroke	2	6.67	7	10.00	9	9.0		
MI	ST	19	63.33	33	47.14	52	52.0	2.205	0.138
	NST	11	36.67	37	52.86	48	48.0		
Hypotension on admission		7	23.33	3	4.29	10	10.0	7.651	0.006*
Pulmonary edema on admission		1	3.33			1	1.0	2.357	0.125
Age	Mean±SD	63.5±4.7		63.3±5.1				T=0.147	0.883

Table 4: Relation between patient characteristics and outcome

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	Outcome						T-Test	
	Poor			Good				
	Mean	±	SD	Mean	±	SD	t	P-value
Na on admission	128.733	±	6.544	132.057	±	7.554	-2.095	0.039*
Na after 48hrs	128.900	±	6.707	131.371	±	6.941	-1.648	0.103
EF	39.700	±	12.595	49.329	±	11.843	-3.656	<0.01*
CPK	1030.1	±	805.29	919.98	±	617.74	2.02	0.03*
MB	305.46	±	524.63	121.72	±	97.52	2.83	0.006*

Table 5 : Relation between hyponatremia at different time points, cardiac enzymes and cardiac function and outcome

Logistic regression	B	S.E.	Wald	P-value	Odd ratio	95.0% C.I. for odd	
						Lower	Upper
CPK	-0.001	0.000	2.455	0.117	0.999	0.999	1.000
MB	-0.002	0.001	3.305	0.069	0.998	0.995	1.000
EF	-0.041	0.020	4.332	0.037	0.959	0.923	0.998
Na	0.876	0.587	7.227	0.0136*	2.402	4.760	7.591
Hypotension on admission	1.692	0.762	4.937	0.026*	5.433	1.221	24.177
Constant	-2.979	1.674	3.166	0.075	0.051		

Table 6: Logistic regression analysis for significant clinical variables

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Cognitive Impairment among Egyptian Older Adults on Hemodialysis

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ABSTRACT

Background: Older patients are now the rule rather than the exception in hemodialysis (HD). Cognitive impairment is common among persons with end stage renal disease (ESRD) and is associated with poor outcomes.

Aim: To assess the prevalence of cognitive impairment among older adults on HD and the association of different patients' demographics and characteristics with cognitive impairment.

Materials and methods: A cross section study was conducted to assess the cognitive functions of elderly subjects on HD. 94 subjects, 60 years old and above, were included. All subjects were subjected to: 1- comprehensive geriatric assessment. 2- Laboratory investigations including: hemoglobin, serum creatinine, serum urea, serum potassium, serum sodium and serum albumin. Kt/V as a marker of dialysis adequacy was calculated.

Results: The study revealed that 26 (27.7%) patients had normal cognitive function, 32 (43%) had mild cognitive impairment, 21 (23%) had mild dementia, 8 (8.5%) had moderate dementia and 7 (7.4%) had severe dementia. Older age, low education level and longer duration of dialysis history were found to have significant associations with cognitive impairment, [P: < 0.001, 0.002, and 0.012 respectively]. While hemoglobin, serum albumin, serum creatinine, serum urea, serum potassium and Kt/V showed no significant association with cognitive impairment, Serum sodium and dry weight dialysis showed significant difference between patients with normal cognitive function and patients with cognitive impairment, [P <0.001 both].

Conclusion: Cognitive impairment is prevalent in Egyptian older adults on HD and more prevalent and severe in those with older age, low education, lower level of serum sodium, longer duration of dialysis history and higher dry weight.

Key words: Cognitive impairment, Egypt, Hemodialysis

Introduction

Older patients are now the rule rather than the exception on hemodialysis (HD). According to the United States Renal Data System (USRDS) data from 2006, nearly one half of incident dialysis patients in the United States are senior citizens, with the median age at dialysis initiation at 64.4 years old. Furthermore, the elderly are the fastest-growing group of incident dialysis patients, meaning that this median age will continue to increase. Nearly all of these elderly patients employ HD, with only 3 to 5% using peritoneal dialysis (PD). (1)

Cognitive impairment is common among persons with end stage renal disease (ESRD) and is associated with poor outcomes, (2) but its underlying mechanisms remain poorly understood. As a result, few evidence-based strategies exist for treating this serious morbidity. Uncontrolled studies have reported improvements in cognitive function after kidney transplantation and more recently, after conversion from conventional to nocturnal hemodialysis, suggesting that modifiable factors associated with ESRD and/or its treatment may be implicated in the pathogenesis of this disorder. (3)

Many studies found that cognitive impairment was prevalent in older adults with CKD on HD as one reported that 37 percent of patients had severe cognitive impairment. (4) And another study found that 38 percent had severe impairment in executive function and 33 percent severe memory impairment. (5)

Several ESRD- and dialysis-associated factors such as retention of uremic solutes, hypertension, hemodynamic instability during dialysis, and anemia may be favorably modified by more frequent hemodialysis schedules. Several of these conditions have also been implicated in the pathogenesis of cognitive impairment. For example, in the National Cooperative Dialysis Study, higher levels of urea clearance were correlated with better cognitive performance. (6) In addition, cardiovascular and hemodynamic factors (hypertension, and at the other extreme, intra dialysis hypotension) may lead to stroke or cerebral ischemia and contribute to cognitive impairment in patients with ESRD. (7)

The etiology of cognitive impairment among HD patients is thought to be multifactorial, and includes factors such as cerebrovascular lesion, (7) hypotension, (8) abnormalities of serological data, (9) social history, (10) and e GFR level; (11) as, each 10 mL/min/1.73 m² decrement in e GFR was found to correspond to an approximately 15 to 25 percent increase in the risk of cognitive dysfunction among individual cognitive domains. (12) In addition, the high prevalence of cardiovascular risk factors might overshadow the roles of aging and non-vascular factors in the development of cognitive impairment. (13)

Dementia is associated with an increased risk of multiple adverse outcomes. Prevalent dementia in hemodialysis patients increases the risk of hospitalization. Dementia also increases costs of care; in 2002 approximately \$19,100 more Medicare dollars were spent over one year on hemodialysis patients with dementia compared to those without. (14) Among hemodialysis patients, dementia was associated with a 1.48 fold increased risk of death over one year. (10)

In this study we assessed the prevalence of cognitive impairment among older adults on HD and association between cognitive impairment and different demographics and characteristics of these patients.

Subjects and Methods

Study setting and sample:

• A cross section study was conducted to assess the cognitive functions in elderly subjects on HD. 94 elderly subjects 60 years old and above (Both males: n=39, and females: n= 55) were recruited from Ain Shams University hospitals.

Exclusion criteria:

• The study did not include subjects with stroke, delirium, alcoholism or drug abuse, psychiatric disease, thyroid disease and auditory or visual impairment were excluded as these conditions are known to affect cognitive functions. Also subjects with chronic liver disease and Chronic Obstructive Pulmonary Disease (COPD) were excluded.

Data collection:

All subjects were subjected to:

A. Informed oral consent.

B. Comprehensive geriatric assessment, including

1. Medical history and physical examination.

2. The Mini-Mental Status Examination MMSE was applied to all the participants to assess their cognitive function. (15)

All subjects were screened for presence of dementia by using the Arabic version of MMSE. (16)

The MMSE was selected because it is the best studied instrument for screening for dementia. (17)

The MMSE comprises 30 questions with 10 devoted to orientation (five regarding time and five regarding place). Three items requiring registration of new information (repeating three words). Five questions addressed attention and calculation. Mental control questions requiring patient to make five serial subtractions of 7 from 100 or spell word backward); three recall items (remembering the three registration items), eight items assessing language skills (two naming items, repeating phrase, following a three-step command, reading and following a written command and writing a sentence), and one construction question (copying a figure consisting of two overlapping pentagons) were used.

According to the MMSE, the subjects were classified into two groups:

Group 1 (controls): cognitively intact: MMSE = 30

Group 2 (cases): cognitively impaired: MMSE < 30

And according to the severity of cognitive impairment, participants in group 2 were further classified into 4 sub-groups:

Group a: mild cognitive impairment: MMSE: 26 - 29.

Group b: early dementia: MMSE: 21 - 25.

Group c: moderate dementia: MMSE: 11 - 20.

Group d: severe dementia: MMSE: 0 - 10.

Age:	
Min	60
Max	80
Mean & SD	67.26 ± 4.95
Sex:	
Male	39 (41.5%)
Female	55(58.5%)
Education:	
Illiterate	17 (18.1%)
Less than High school education	40 (42.6%)
High school education and more	37(39.3%)
Dialysis duration (year):	
Min	1
Max	11
Mean & SD	4 ± 2.75
Total score of MMSE:	
Min	6
Max	30
Mean & SD	25 ± 6
History of diabetes mellitus (DM):	
Absent	37 (39.4%)
Present	57 (60.6%)
History of hypertension:	
Present	12 (12.8%)
Absent	82 (87.2%)
History of heart Disease:	
Present	25 (26.6%)
Absent	69 (73.4%)
Hemoglobin(g\dl):	
Min	7.7
Max	13.3
Mean & SD	10.75 ± 1.36
Serum albumin(g\dl):	
Min	2.4
Max	4.2
Mean & SD	3.5 ± 0.39
Serum Potassium (mmol\L):	
Min	3.5
Max	6.8
Mean & SD	4.9 ± 0.72
Serum sodium (mmol\L):	
Min	123
Max	146
Mean & SD	136.05 ± 5.86
Serum creatinine (mg\dl):	
Min	3.4
Max	18.4
Mean & SD	10.1 ± 2.8
Serum urea (mg\dl):	
Min	34
Max	93
Mean & SD	63.2 ± 11.92
Dialysis adequacy (Kt/V):	
Min	0.64
Max	1.98
Mean & SD	1.23 ± 0.29
Dry weight (Kg):	
Min	56
Max	126
Mean & SD	80.75 ± 18.07

Results

<< Table 1: Patient's demographics and characteristics

C. Laboratory Investigations including:

- Hemoglobin (g\dl)
- Serum creatinine (mg\dl)
- Serum urea (mg\dl)
- Serum potassium (mmol\L)
- Serum sodium (mmol\L)
- Serum albumin (g\dl)
- Serum blood urea nitrogen (mg\dl) pre-dialysis and post-dialysis

D. Dialysis adequacy:

Kt/V as a marker of dialysis adequacy
Kt/V is a number used to quantify hemodialysis treatment adequacy.

- **K** - dialyzer clearance of urea
- **t** - dialysis time
- **V** - volume of distribution of urea, approximately equal to patient's total body water

In the context of hemodialysis, Kt/V is a pseudo-dimensionless number; it is dependent on the pre- and post-dialysis concentration. It is not the product of K and t divided by V, as would be the case in a true dimensionless number. (18)

It was developed by Frank Gotch and John Sargent as a way of measuring the dose of dialysis when they analyzed the data from the National Cooperative Dialysis Study. (19) In hemodialysis the US National Kidney Foundation Kt/V target is ? 1.3, so that one can be sure that the delivered dose is at least 1.2 (20)

Calculation of Kt/V needs serum blood urea nitrogen (mg/dl) pre-dialysis and post-dialysis, weight of the patient pre-dialysis and post-dialysis, treatment time (minute) and frequency of treatments/week. With these parameters Kt/V is calculated by using an online calculator:

<http://www.davita.com/ktvcalculator/>

Statistical Methods:

All data were entered into the 21st version of SPSS (Statistical Package of Social Science) and analyzed using frequency and descriptive statistics to analyze the study population. Frequency and percentage was calculated for all qualitative variables. Description of all data in the form of mean (M) and standard deviation (SD) was done for all quantitative variables. Comparison of qualitative variables was done using Chi-square test; it is a test that determines the extent that a single observed series of proportions differs from a theoretical or expected distribution of proportions, or the extent that two or more series of proportions or frequencies differ from one another based on the chi-square distribution.

Comparison between quantitative variables was done using ANOVA (analysis of variance) to compare between more than two groups.

The level of significance for Chi-square test and ANOVA was taken at P value < 0.05 is significant, otherwise it is non-significant.

Results

The study was conducted on 94 older patients on regular haemodialysis. Table 1 shows the demographics and characteristics of the older adults: The mean age of the sample was 67.26 ± 4.95 (range: 60 - 80). The sample included 39 (41.5%) males and 55 (58.5%) females. Among the 94 older subjects; 17 (18.1%) were illiterate, 40 (42.6%) had less than high school education and 37 (39.3%) had high school education or more. The mean dialysis duration in years was 4 ± 2.75 (range: 1 - 11). The mean of Total score of MMSE was 25 ± 6 (rang 30-6). 37 (39.4%) subjects had no history of DM and 57 (60.6%) had history of DM. 25 (26.6%) subjects had history of heart disease and 69 (73.4%) did not. 12(12.8%) subjects had history of HTN and 82 (87.2%) had no HTN. The mean hemoglobin level was 10.75 ± 1.36 (range 7.7 - 13.3). The mean level of serum albumin was 3.5 ± 0.39 (range 2.4 - 4.2). The mean level of serum potassium was 4.9 ± 0.72 (range 3.5 - 6.8). The mean level of serum sodium was 136.05 ± 5.86 (range 123 - 146). The mean level of serum creatinine was 10.1 ± 2.8 (range 3.4 - 18.4). The mean level of serum urea was 63.2 ± 11.92 (range 34 - 93). The mean value of dialysis adequacy (Kt/V) was 1.23 ± 0.29 (range 0.64 - 1.98). The mean value of dry body weight (Kg) 80.75 ± 18.07 (range 56 - 126).

Figure 1:

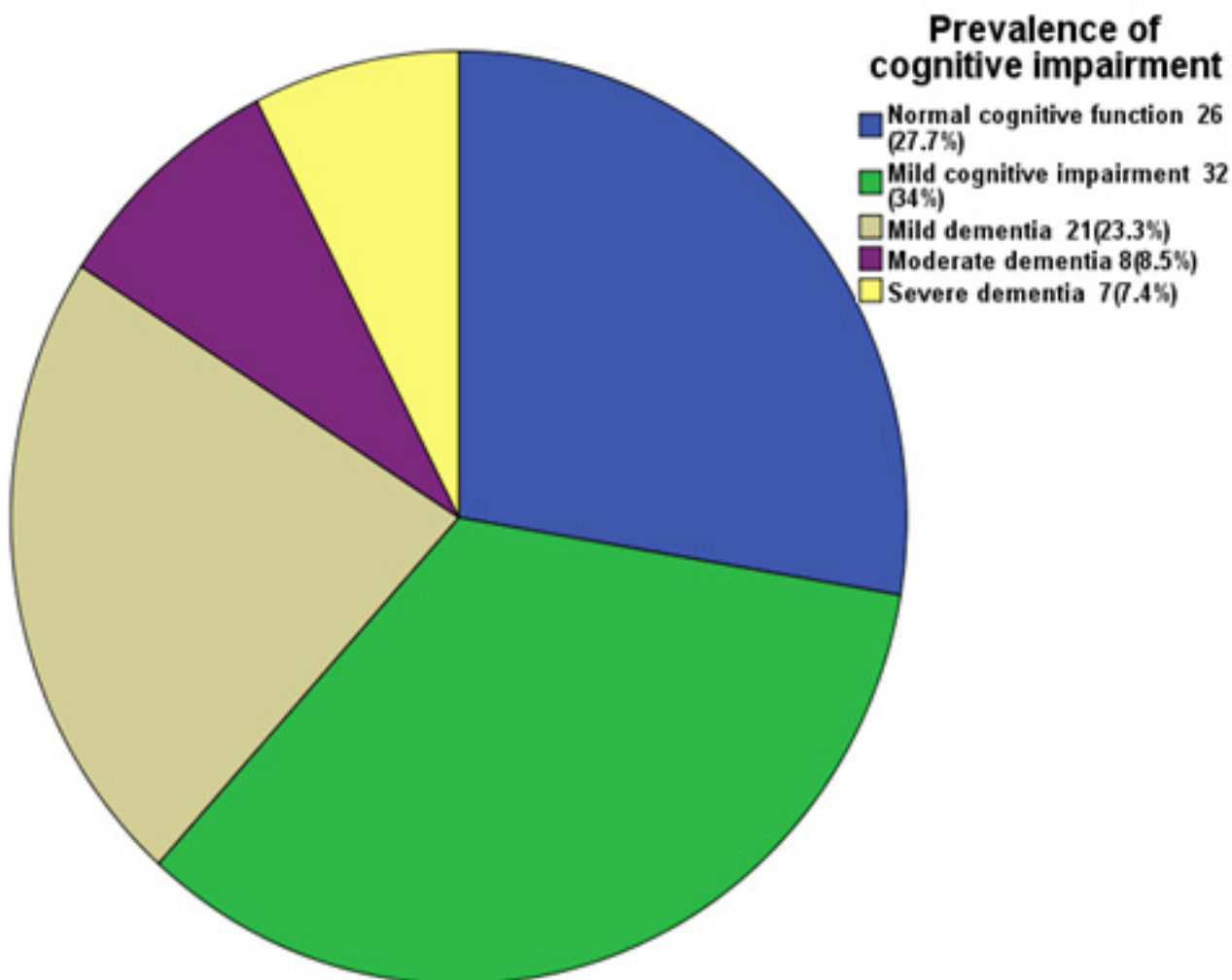


Figure 1 shows that 26 (27.7%) patients had normal cognitive function, 32 (43%) had mild cognitive impairment, 21 (23%) had mild dementia, 8 (8.5%) had moderate dementia and 7 (7.4%) had severe dementia.

Table 2 (next page) shows the association of patients' demographics and characteristics with cognitive function; the mean age of the patients with normal cognitive function was 67.1 ± 3.16 , while for patients with severe dementia was 73.85 ± 3.33 , [P:<0.001]. Sex did not show a significant difference between patients with normal cognitive function and patients with cognitive impairment [P: 0.35]. Also history of DM, HTN heart disease did not show significant association with cognitive function [P: 0.21, P: 0.87, P: 0.82 respectively]. The education level and the duration of dialysis history showed significant differences between patients with normal cognitive function and patients with cognitive impairment, [P: 0.002, P: 0.012 respectively]. While hemoglobin level, serum albumin, serum creatinine, serum urea and serum potassium showed no significant difference between patients with normal cognitive function and patients with cognitive impairment, [P: 0.099, P: 0.17, P: 0.18, P: 0.08, P: 0.35 respectively]. Serum sodium showed significant difference between patients with normal cognitive function and patients with cognitive impairment, [P:< 0.001]. And also Dry weight dialysis showed significant difference between patients with normal cognitive function and patients with cognitive impairment, [P :< 0.001], while dialysis adequacy (Kt/v) showed no significant difference between patients with normal cognitive function and patients with cognitive impairment, [P: 0.79].

Table 2: Relationship between Patients' characteristics and cognitive impairment:

	Normal cognitive function	Mild cognitive impairment	Mild dementia	Moderate dementia	Severe dementia	
Age	Mean SD 67.1 ± 3.16	Mean SD 67.1 ± 3.1	Mean SD 67.9 ± 4.36	Mean SD 74.25 ± 2.3	Mean SD 73.85 3.33	F 24.4 P:< 0.001
Sex						
Male	8	17	7	4	3	X: 3.8 P: 0.425
Female	18	15	14	4	4	
Education						
-Illiterate	0	6	4	3	4	X: 24.3 P: 0.002
-Less than High school education	8	16	9	4	3	
-High school education and more	18	10	8	1	0	
Dialysis duration (year)	Mean SD 3.69 ± 2.4	Mean SD 3.0 ± 2.26	Mean SD 4.7 ± 2.7	Mean SD 5.0 ± 3.5	Mean SD 6.42 ± 3.55	F 3.42 P: 0.012
History of DM						
No history of DM	13	8	8	5	3	X: 5.84 P: 0.21
History of DM	13	24	13	3	4	
History of HTN						
No history of HTN	22	28	18	7	7	X: 1.23 P: 0.87
History of HTN	4	4	3	1	0	
History of Heart Disease						
No history of Heart disease:	17	24	17	6	5	X: 1.53 P: 0.82
History of Heart disease:	9	8	4	2	2	
Hemoglobin(g\dl)	Mean SD 10.8 ± 1.26	Mean SD 10.4 ± 1.47	Mean SD 11.0 ± 1.24	Mean SD 10.3 ± 1.68	Mean SD 11.8 ± 0.9	F: 2.01 P:0.099
Serum albumin (g\dl)	Mean SD 3.4 ± 0.37	Mean SD 3.6 ± 0.31	Mean SD 3.5 ± 0.44	Mean SD 3.36 ± 0.42	Mean SD 3.3 ± 3.55	F: 3.42 P: 0.17
Serum Potassium (mmol\L)	Mean SD 4.8 ± 0.69	Mean SD 4.98 ± 0.7	Mean SD 4.9 ± 0.73	Mean SD 5.2 ± 0.82	Mean SD 4.5 ± 0.5	F: 1.6 P: 0.35
Serum sodium (mmol\L)	Mean SD 142.9 ± 1.74	Mean SD 137.2 ± 1.87	Mean SD 132 ± 2.6	Mean SD 127.7 ± 1.6	Mean SD 126.2 ± 2.3	F 167.5 P<0.001
Serum creatinine (mg\dl)	Mean SD 9.1 ± 1.7	Mean SD 10.1 ± 3.18	Mean SD 11.1 ± 3.6	Mean SD 10.2 ± 3.2	Mean SD 11.3 ± 0.8	F: 1.59 P: 0.18
Serum urea (mg\dl)	Mean SD 58.1 ± 5.8	Mean SD 65.56 ± 13.65	Mean SD 63.0 ± 16.0	Mean SD 67.3 ± 5.5	Mean SD 671.5 ± 3.64	F: 2.13 P: 0.08
Dialysis adequacy (Kt/V)	Mean SD 1.27 ± 0.3	Mean SD 1.18 ± 0.26	Mean SD 1.25 ± 0.28	Mean SD 1.24 ± 0.37	Mean SD 1.25 ± 0.29	F: 0.42 P: 0.79
Dry weight (Kg)	Mean SD 84.9 ± 10.9	Mean SD 69.3 ± 12.9	Mean SD 74.5 ± 6.28	Mean SD 105.8 ± 12.1	Mean SD 107.3 ± 8.7	F: 22.8 P:<0.001

Discussion

The purpose of this study was to determine prevalence of cognitive impairment among older adults on HD and to assess the association between the prevalence and severity of cognitive impairment with different demographics and characteristics of these patients.

Despite the growing numbers of patients with ESRD and dementia, the medical literature did not truly explore the intersection of these two groups of patients. Recently, Seliger et al, 2004 [21] reported that elevated serum creatinine was associated with a higher risk for dementia in older adults who reported either good or excellent health.

In our study we found that prevalence of cognitive impairment among older adults on HD was 72.3 % (43% had mild cognitive impairment, 23% had mild dementia, 8.5% had moderate dementia and 7.4% had severe dementia).

This result was supported by Kurella et al, 2004 [5] who studied 80 HD patients (mean age 61.2 ± 14.3 years) and found that prevalence of severe memory impairment was 33 %.

Also Tyrrell et al, 2005 [22] found that in older adult patients on HD the prevalence of cognitive impairment, based on the Mini-Mental State Examination (MMSE), was 47% of 51 HD outpatients.

This was also supported by Gen et al, 2011 [23] who found that the prevalence of cognitive impairment based on the MMSE was 18.8% in HD patients. They stated that HD patients had showed a higher prevalence of cognitive impairment in older groups (50 years and older).

Also we agreed with another study conducted by Murray et al, 2006 [4] to assess the cognitive function across multiple cognitive domains in 338 HD patients (mean age, 71.2 ± 9.5 years) and found that among older adults on HD, 13.9% were classified with mild impairment, 36.1% with moderate impairment, 37.3% with severe impairment, and 12.7% with normal cognition.

The prevalence of severe cognitive impairment in some studies was higher than our study as the authors included patients with history of cerebrovascular diseases. But in our study we excluded them and other diseases that could directly affect cognitive function e.g. alcoholism, drug abuse, psychiatric disease, thyroid disease, auditory or visual impairment, chronic liver disease and chronic obstructive pulmonary disease (COPD).

Rakowski et al, 2006 [24] and Laudanski et al, 2010 [25] reported that in patients undergoing HD, cognitive impairment brought more serious consequences, such as hospitalization and reduced life expectancy. They also added that cognitive impairment in HD patients might hinder them from complying with dialysis schedules, medications, and dietary restrictions

Also our study revealed that cognitive impairment was more prevalent and more severe in patients with older age, lower education level, longer duration of hemodialysis, lower level of serum sodium and higher dry weight.

This was supported by Gen et al, 2011 [23] who found that among HD patients, level of education was associated with MMSE score, and added that serum sodium level, dry weight and history of cerebrovascular disease tended to be associated with low MMSE score of HD patients.

Also Murray et al, 2006 [4] who assessed the cognitive function across multiple cognitive domains in 338 HD patients, found that low education was associated with severe cognitive impairment.

Sehgal et al, 1997 [26] stated that older age and lower education level were independently associated with less than 24 points achievement on MMSE test in multivariable analysis.

As regards hyponatremia, Gen Odagiri et al, 2011 [27] found a significant relationship [$P = 0.05$] between hyponatremia and the MMSE score among HD patients; they added that this relationship was also reported in a previous study by Maugeri et al. 1999 [28]

Hyponatremia depends on various factors including blood dilution by chronic fluid overload and dietary sodium restriction. [29] These factors might explain why no correlations were observed with other blood parameters, which were, to some extent, stabilized by HD.

The relationship between higher dry weight and cognitive impairment could be explained by the known relationship between obesity and cognitive impairment as reported by Gustafson et al, 2003 [30] who found an association between greater BMI at age 70 and greater risk of incident dementia in an 18-year longitudinal observational study.

Our result also showed although the mean levels of serum urea and serum creatinine were higher in patients with severe cognitive impairment than patients with normal cognitive function, this was statistically insignificant. This can be explained by the relatively small sample size.

Also the results showed that although dialysis adequacy (mean of Kt/v) was high in patients with normal cognitive function than those with cognitive impairment this was statistically insignificant. This can be explained as the dialysis adequacy (mean of Kt/v) for the whole sample (with and without cognitive impairment) was satisfactory.

This study was supported by Dahbour et al, 2009 [31] who studied and compared the predialysis (PrHDSc) and postdialysis (PoHDSc) mini mental status examination score Patients' (PrHDSc) correlated positively with PoHDSc and dialysis efficiency measured by Kt/V ($r=0.58, 0.4, \text{ and } 0.34$, respectively). Education level correlated positively with PrHDSc $r=0.41$ but not PoHDSc.

Conclusion

Cognitive impairment was prevalent in Egyptian older adults on HD and more prevalent and severe in those with older age, lower education, longer history of hemodialysis duration, lower level of serum sodium and higher dry weight. So we recommended including cognitive evaluation in assessment of

older adults on HD and conduction of of a larger sample size case control study to identify modifiable risk factors of cognitive impairment in older adults on HD.

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Health Care Services utilization and satisfaction among elderly in Dubai, UAE and some Associated Determinants

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ABSTRACT

Background : Planning and utilization of health services in the elderly group is a very important concern for both elderly as well as health care services providers. Quality of care is an essential need in health care delivery, and patient satisfaction has become an integral component of health care quality management

Objectives: To assess the elderly utilization and satisfaction with primary health care services provided at Dubai Health Authority and their associated factors. To study associated Determinants.

Materials and methods: A cross sectional study was carried out in primary health care facilities at Dubai Health Authority, United Arab Emirates among elderly (aged 65 years or more) similar to most developed world countries which accepted the chronological age of 65 years as a definition of elderly. Sample size estimation through Utilizing EPI_INFO "6.04", applying certain criteria was (384) participant both males and females. Sample type was Stratified random sample with proportional allocation.

Results : The study has revealed that Elderly having not enough income were more liable to be high utilizers of services as compared to those having enough and more than save income (OR= 0.32; CI: 0.14-0.74). Elderly with IHD and thBackground: Urinary tract infection is a very common problem in general practice, but it is more prominent in elderly patients and its average prevalence is 25-40%. This is according to the most recent studies. Perfect treatment of this problem is very important because it is associated with a lot of complications like pyelonephritis and hypertension. This study was performed to determine the benefits of good diagnosis and management, depending on results of urine culture.

Methods: A retrospective study of homecare residents was done between September 2010 to September 2011. We reviewed the medical records and files of all patients.

Introduction

Planning and utilization of health services in the elderly group is a very important concern for both elderly as well as health care services providers. (1) Quality of care is an essential need in health care delivery, and patient satisfaction has become an integral component of health care quality management. (2,3) Patient satisfaction has long been considered as a vital component when measuring health outcomes and quality of care. The prevalence of most chronic conditions rises with age, particularly stroke, heart disease, cancer, cataracts, risk of falls and incontinence. Integrated care models, which bridge across health and social care, are needed to help manage chronic conditions effectively in the community setting.(4) The health status of older adults is evaluated by tracking mortality and morbidity statistics, functional status measures, amount, type, frequency of social and health care services utilization and lifestyle behaviours related to health. (5) The global increase in people aged 60 years and above has attracted the attention of the world to the magnitude of the problems of providing health care for the elderly.(1) Elderly patients have a disproportionately high need for usage of health care. (4) World Health Organization set objectives for elderly care including; prevention of unnecessary loss of function, maintain good quality of life, keep elderly in their own homes as long as they wish, provide support of families or carers, and provide good quality terminal care. (6) Because the elderly tend to have multiple disorders and may have social or functional problems, they use a disproportionately large amount of health care resources. (7)

Elderly, and female in particular, report higher rates of services utilization, (8) 8 and educated elderly showed a higher utilization with primary health care. (9) On the other hand poor education, poverty, lack of drugs and basic laboratory services were identified as a barrier to utilization of services. (10) Several studies showed that satisfied patients are more adherent to medical treatment and have more symptom resolution. (11,12,13) Furthermore a satisfied patient is more likely to develop a deeper and longer lasting relationship with their medical provider, leading to improved compliance, continuity of care and ultimately better health outcomes. (13) A study conducted in Italy (2007) (14), reported that more than 60% of the elderly patients considered the healthcare they received to be satisfactory. Another study conducted in Saudi Arabia (2004) (15), found that 79.0% of elderly people were satisfied with the services provided by PHC. Although patient satisfaction has been assessed across various patient groups and care settings, only a few studies have been done among elderly patients. (16) This could indicate a low priority to the investigation of elderly patients' view of their care.

Objectives

To assess the elderly utilization and satisfaction with primary health care services provided at Dubai Health Authority and their associated factors. To study associated Determinants

Materials and Methods

A cross sectional study was carried out in primary health care facilities at Dubai Health Authority, United Arab Emirates among elderly (aged 65 years or more) similar to the most developed world countries which accepted the chronological age of 65 years as a definition of elderly. Elderly patients with communication problems, such as those with severe hearing impairment, and Elderly patients with a previous diagnosis of dementia, were excluded. Sample size estimation through Utilizing EPI_INFO "6.04", applying certain criteria was (384) participants both males and females. Sample type was Stratified random sample with proportional allocation.

Results

Table 1 shows that the only significant predictor for high utilization of PHC services was elderly household income. Elderly having not enough income were more liable to be high utilizers of services as compared to those having enough and more than save income (OR= 0.32; CI: 0.14-0.74).

Table 2 (page 28) shows that among studied medical characteristics, elderly with IHD and those with osteoporosis were significantly more liable to be high utilizers of services as compared to those without these diseases (OR= 0.56; CI: 0.32-0.97 and OR= 0.36; CI: 0.16-0.79 respectively).

Table 3 shows that utilization of PHC services was significantly associated with total, effectiveness, and accessibility items of satisfaction scores, as lower utilizers of these services were significantly more very satisfied than high utilizers ($P < 0.05$). On the other hand, there was no statistically significant association between utilization of services and other items of satisfaction score.

Table 4 shows that the only significant predictor of satisfaction with services was household income. Elderly having enough income were more liable to be very satisfied with services as compared to those having enough and more than save income (OR= 0.24; CI: 0.20-0.88). Similarly, those having not enough income were more liable to be very satisfied with the provided services as opposed to those having enough and more than save income. However, the association was not statistically significant (OR= 0.82; CI: 0.29-2.31). Among medical characteristics shown in Table 5, only history of osteoporosis was the only significant predictor for satisfaction with provided services. Elderly with history of osteoporosis were more liable to be less very satisfied with services as compared to those without history of osteoporosis (OR= 2.46; CI: 1.04-5.83).

Discussion and Limitations

The present study also revealed that the highest percentage of the elderly in Dubai were utilizing PHC services less than once/month (66.4%); most of them coming for regular treatment of chronic diseases every 3 months. Similarly, regarding utilization of services, it was found that among the average elderly persons over 65 years of age in Pakistan, 2009, as shown by Saleem T, Khalid U, Qidwai study, expectations of their physicians: findings from a tertiary care

Table 1: Socio-demographic characteristics as predictors for utilization of PHC centres services: univariate analysis

Socio-demographic variables	High utilizer (n=129)	Low utilizer (n=255)	OR	95% CI
Age in years				
65- (n=292)	97 (33.2)	195 (66.8)	1.0	
75- (n=81)	29 (35.8)	52 (64.2)	0.89	0.52-1.54
85- (n=11)	3 (27.3)	8 (72.7)	1.33	0.31-6.46
Gender				
Males (167)	53 (31.7)	114 (68.3)	1.0	
Females (217)	76 (35.0)	141 (65.0)	0.86	0.55-1.35
Marital status				
Single (7)	3 (42.9)	4 (57.1)	1.0	
Married (270)	89 (33.0)	181 (67.0)	1.53	0.26-8.27
Divorced (6)	2 (33.3)	4 (66.7)	1.50	0.09-25.84
Widowed (101)	35 (34.7)	66 (65.3)	1.41	0.23-8.08
Occupation				
Working (19)	8 (42.1)	11 (57.9)	1.0	
Retired (145)	44 (30.3)	101 (69.7)	1.67	0.57-4.88
House wife (220)	77 (35.0)	143 (65.0)	1.35	0.47-3.81
Educational level				
Secondary and above (17)	5 (29.4)	12 (70.6)	1.0	
Less than secondary (93)	39 (41.9)	54 (58.1)	0.58	0.16-1.96
Illiterate (274)	85 (31.0)	189 (69.0)	0.93	0.27-2.95
House hold income				
More than enough (77)	25 (32.5)	52 (67.5)	1.0	
Enough (262)	77 (29.4)	185 (70.6)	1.16	0.64-2.06
Not enough (45)	27 (60.0)	18 (40.0)	0.32	0.14-0.74*

*P=0.005

hospital in Pakistan uses more health care services than non elderly individuals. More than 50% of the patients were visiting their physicians at least once every two to three months. A previous study conducted in Alexandria 2002, (17) among elderly patients attending different outpatient clinics, found that most of the elderly visit the clinic once or twice/month i.e. 12-24 visits/year. The Asir study (18) demonstrated that their elderly utilized PHC centres fewer times/year than the younger adult age group. On the other hand, a much lower rate of utilization was found among the elderly population in Brazil 2007(19), where 72% of them sought and received health care services at least once/6 months. The type of illness or symptoms experienced for the particular illness and duration are

all known to affect health service utilization.(20) A study conducted in South Africa in 2010, (21) among patients attending community health care centre 16 years old and above showed that, above 45 years of age females and males (81.8%- 75%) visited the tuberculosis clinic frequently, followed by presence of history of diabetes (76.7% male and 75.9% female) and hypertension, 25% for both. The present study found that, the presence of IHD and those with osteoporosis were significantly more liable to be high utilizer of the services.

The present study revealed that elderly have not enough income and has a statistically significant high rate of utilization of PHC services at DHA. This finding is congruent with other

Table 2: Medical characteristics as predictors for utilization of PHC centres services: univariate analysis

Chronic diseases	High utilizer (n=129)	Low utilizer (n=255)	OR	95% CI
History of chronic diseases				
No (n=5)	0 (0.0)			
1-2 diseases (n=91)	18 (19.8)	5 (100.0)	1.0	
≥3 diseases (n=288)	111 (38.5)	73 (80.2)	0.81	0.66-1.40
		177 (61.5)	0.32	0.01-2.85
Diabetes mellitus				
No (121)	32 (26.4)			
Yes (263)	97 (36.9)	89 (73.6)	1.0	
		166 (63.1)	0.62	0.37-1.02
Hypertension				
No (114)	31 (27.2)			
Yes (270)	98 (36.3)	83 (72.8)	1.0	
		172 (63.7)	0.66	0.39-1.09
Dyslipidemia				
No (28)	7 (25.0)			
Yes (356)	122 (34.3)	21 (75.0)	1.0	
		234 (65.7)	0.64	0.24-1.64
Ischemic heart disease				
No (310)	96 (31.0)			
Yes (74)	33 (44.6)	214 (69.0)	1.0	
		41 (55.4)	0.56	0.32-0.97*
Osteoarthritis				
No (249)	75 (30.1)			
Yes (135)	54 (40.0)	174 (69.9)	1.0	
		81 (60.0)	0.65	0.41-1.03
Osteoporosis				
No (352)	111 (31.5)			
Yes (32)	18 (56.3)	241 (68.5)	1.0	
		14 (43.7)	0.36	0.16-0.79**
COPD ☐				
No (356)	118 (33.1)	238 (66.9)	1.0	
Yes (28)	11 (39.3)	17 (60.7)	0.77	0.33-1.81

*P=0.028; **p=0.004; Chronic obstructive pulmonary disease

Table 3: Association between utilization of services and satisfaction (n=384).

Satisfaction	Low utilizers N=255 No. (%)	High utilizers N=129 No. (%)	χ^2 (P-value)
Accessibility subscale			
Satisfied (n=339)	52 (20.4)	38 (29.5)	3.92 (0.033)
Very satisfied (n=45)	203 (79.6)	91 (70.5)	
Continuity and humaneness subscale			
Satisfied (n=31)	20 (7.8)	11 (8.5)	0.05 (0.479)
Very satisfied (n=353)	235 (92.2)	118 (91.5)	
Informativeness and thoroughness subscale			
Satisfied (n=339)	225 (88.2)	114 (88.4)	0.002 (0.557)
Very satisfied (n=45)	30 (11.8)	15 (11.6)	
Effectiveness subscale			
Satisfied (n=42)	21 (8.2)	21 (16.3)	5.69 (0.015)
Very satisfied (n=342)	234 (91.8)	108 (83.7)	
Total score			
Satisfied (n=50)	26 (10.2)	24 (18.6)	5.35 (0.017)
Very satisfied (n=334)	229 (89.8)	105 (81.4)	

studies which suggest that individuals with higher income have more tendency to use private services (Al-Doghaithe 2003, (22) Andaleeb 2000, (23) and Al Ghanim. (24) Elderly needing help with ADL alone or ADL with IADL, increased their difficulty in accessing PHC by 39% which decreased their utilization of PHC centres as reported by a study done in the USA 2001, (25) while our study revealed no statistical significance between elderly with ADL or IADL and utilization of the PHC services. This can be explained by preparation of PHC building for easy access, presence of care giver and way of treating (nurses, administrative, medical record staff and physician) elderly with functional disability by easy access and less waiting time. The present study revealed that another significant predictor for being a high utilizer (once or more /month) of PHC services at DHA was being satisfied with services provided. Asir's study (17) revealed that the majority of elderly people (aged 60+ years) were satisfied with the services provided (79.0%) and accordingly preferred always to use the health services provided by the centre. An Alexandria study (17) revealed that multiple regression analysis utilization of other sources of medical care had a significant negative relation to total satisfaction score of the elderly about their facility. High degree of satisfaction was revealed as in

the overall satisfaction scale, 87.0% of the interviewed elderly persons reported being very satisfied while 13.% were satisfied with the PHC services provided. This is consistent with a study conducted in Sweden 2010, (26) among patients aged 20 years old and above attending medical centres, which showed that the elderly were the most satisfied group (90%) in comparison with younger age groups (76%). Among Gulf countries, a study was conducted in Saudi Arabia in 2001, (27) and included patients aged 15 years old and above attending PHC centres of Riyadh and revealed a lower rate of satisfaction (60% among the whole group). Another study conducted in Kuwait in 2008, (28) among patients 16 years of age and above attended PHC showed near satisfaction level (67.0% elderly age group compared to 61% among adult group).

Most satisfaction studies have revealed that satisfaction is multi-factorial and no one factor could be claimed to be the only contributor to satisfaction or dissatisfaction. (29)

Although older age was significantly associated with the risk of being less very satisfied regarding continuity and humaneness subscale of satisfaction in the bivariate analysis, it is not so in other subscales or in the multivariate analysis. Moreover,

Table 4: Association between socio-demographic characteristics of elderly and total satisfaction scale: univariate analysis

Socio-demographic variables	Satisfied (n=50)	Very satisfied (n=334)	OR	95% CI
Age in years				
65- (n=292)	35 (12.0)	257 (88.0)	1.0	
75- (n=81)	14 (17.3)	67 (82.7)	1.53	0.74-3.16
85- (n=11)	1 (9.1)	10 (90.9)	0.73	0.11-5.04
Gender				
Males (167)	22 (13.2)	145 (86.8)	1.0	
Females (217)	28 (12.9)	189 (87.1)	0.98	0.54-1.78
Marital status				
Single (7)	3 (42.9)	4 (57.1)	1.0	
Married (270)	32 (11.9)	238 (88.1)	0.18	0.03-1.07
Divorced (6)	2 (33.3)	4 (66.7)	0.67	0.04-10.72
Widowed (101)	13 (12.9)	88 (87.1)	0.20	0.03-1.27
Occupation				
Working (19)	3 (15.8)	16 (84.2)	1.0	
Retired (145)	19 (13.1)	126 (86.9)	0.80	0.19-3.84
House wife (220)	28 (12.7)	192 (87.3)	0.78	0.20-3.60
Educational level				
Secondary and above (17)	3 (17.6)	14 (82.4)	1.0	
Less than secondary (93)	19 (20.4)	74 (79.6)	1.20	0.28-5.86
Illiterate (274)	28 (10.2)	246 (89.8)	0.53	0.13-2.49
House hold income				
More than enough (77)	16 (20.8)	61 (79.2)	1.0	
Enough (262)	26 (9.9)	236 (90.1)	0.42	0.20-0.88*
Not enough (45)	8 (17.8)	37 (82.2)	0.82	0.29-2.31

*P=0.0071

patients aged 85 years or more were more likely to be very satisfied with all other subscales and the total satisfaction scale. This may be explained by the fact that the study included elderly people only and significant differences may not be apparent between the different categories of elderly group. Another study conducted in UAE,(30) has shown that age was a significant factor for the effectiveness subscale of satisfaction. Also, Al-Eisa (31), found that the older the patient, the higher the satisfaction. This may be due to the elderly having lower expectations about the service provided; hence they have higher satisfaction than younger population. Regarding gender, the present study found that females were less satisfied than males with the continuity of care, but there was no statisti-

cally significant difference. This result is consistent with the previous studies in Qatar 2009, (32), conducted among patients attending PHC centre aged 16 years old and above, and Al Sakaak (33) and Al Eisa (31) also found that males were significantly more satisfied than females. Al-Dawood (34) identified sex of the respondent as the most influential factor on the level of satisfaction. Among other sociodemographic variables, the present study demonstrated that the only predictors of being very satisfied were the educational status and income. According to the education status, studies showed contradictory findings; some had a positive effect of education and others revealed negative effect on satisfaction. A study conducted in Dubai 2008, (35) among patients attending Al Khawaneej

Table 5: Association between medical characteristics of elderly and total satisfaction scale: univariate analysis

Chronic diseases	Satisfied (n=50)	Very satisfied (n=334)	OR	95% CI
History of chronic diseases				
No (n=5)				
1-2 diseases (n=91)	1 (20.0)	4 (80.0)	1.0	
≥3 diseases (n=288)	11 (12.1)	80 (87.9)	0.55	0.05-14.14
	38 (13.2)	250 (86.8)	0.61	0.06-14.67
Diabetes mellitus				
No (121)				
Yes (263)	13 (10.7)	108 (89.3)	1.0	
	37 (14.1)	226 (85.9)	1.36	0.69-2.66
Hypertension				
No (114)				
Yes (270)	15 (13.2)	99 (86.8)	1.0	
	35 (13.0)	235 (87.0)	0.98	0.90-2.45
Dyslipidemia				
No (28)				
Yes (356)	4 (14.3)	24 (85.7)	1.0	
	46 (12.9)	310 (87.1)	0.89	0.30-2.68
Ischemic heart disease				
No (310)				
Yes (74)	37 (11.9)	273 (88.1)	1.0	
	13 (17.6)	61 (82.4)	1.57	0.79-3.14
Osteoarthritis				
No (249)				
Yes (135)	27 (10.8)	222 (89.2)	1.0	
	23 (17.0)	112 (83.0)	1.69	0.93-3.08
Osteoporosis				
No (352)				
Yes (32)	42 (11.9)	310 (88.1)	1.0	
	8 (25.0)	24 (75.0)	2.46	1.04-5.83*
COPD <input type="checkbox"/>				
No (356)				
Yes (28)	50 (14.0)	306 (86.0)	1.0	
	0 (0.0)	28 (100.0)	0.80	0.33-1.93

*P=0.039; Chronic obstructive pulmonary disease

health centre, 20 years old and above, showed that, the low educated patients were very satisfied with the services provided. A study conducted in Croatia 2001, (36) among patients from 18 years old and above attending 47 PHC found that less educated people were more satisfied; the researcher proposed that less educated people may be more satisfied as they are less demanding. While a study in Qatar, (32) found that, those with higher education had lower but statistically insignificant level of satisfaction with continuity of care. On other hand the present study also revealed that those with less than secondary education had double to triple the risk of being less satisfied regarding effectiveness, continuity and humaneness subscales and the total satisfaction scale (together with the illiterate in the total scale). Contrary to the previous explanation regarding the relation between education and satisfaction, it may be proposed that some of those of lower educational level may underestimate the effort and services provided; hence they may be less very satisfied. A Community based sample would be more appropriate, but was not adopted due to time constraints. Community based sample would be also more accurate in portraying the actual pattern of health service utilization. Moreover, results of the present study may not be generalized to the whole PHC, as quality of care and patient characteristics may differ in different PHC centres. A recall bias may also have been encountered, as the elderly may express their satisfaction about the present or last visit to the PHC, which may not reflect the usual quality of services provided.

Conclusion

The majority of the elderly at the primary health care centres were low utilizers (Less than once/month) of services. The significant determinants of being less very satisfied about the services provided were being illiterate or with an educational level less than secondary school, having osteoporosis, while presence of history of COPD increased the liability for being more very satisfied.

Recommendations

The integration and coordination of health and welfare programmes and services to address effectively the various needs of older people and to improve primary health care systems to protect and promote healthy lifestyles, and to tackle the chronic health problems among an ageing population.

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Urinary Tract Infection in Home Care Patients Qatar, Doha

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ABSTRACT

Background: Urinary tract infection is a very common problem in general practice, but it is more prominent in elderly patients and its average prevalence is 25-40%. This is according to the most recent studies. Perfect treatment of this problem is very important because it is associated with a lot of complications like pyelonephritis and hypertension. This study was performed to determine the benefits of good diagnosis and management, depending on results of urine culture.

Methods: A retrospective study of homecare residents was done between September 2010 to September 2011. We reviewed the medical records and files of all patients. 132 patients of the total residents(614) had UTIs within the period of study.

Results: One hundred and thirty two had growth of microorganisms. Most of them were single organism (80% of the growth is due to a single organism), but about more than 50% were associated with bacteria in the urine, usually more than 100,000 organisms per ml. The most common causative organism was E.COLI (57 patients) i.e 42.5% of total patients who suffered of UTI.

Conclusions:

Asymptomatic bacteriuria is common in elderly patients, but it is more common in women.

Pyuria is not a reliable predictor of bacteriuria.

Dementia, incontinence, catheterization, diabetes mellitus & decreased mobility are risk factors for developing UTIs.

Residential care residents often can't give reliable histories.

Urinalysis and culture must be done for atypical symptoms, - Change in behavior , Decrease in appetite etc

Key words: Bacteriuria; long term care patients, urine culture; sensitivity, Foley's catheter, homecare

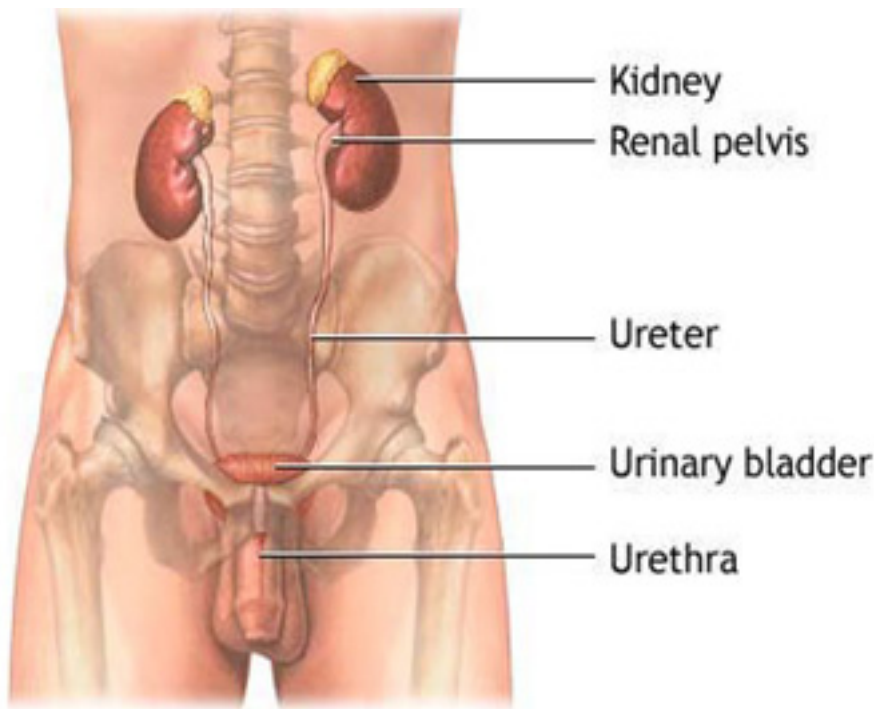


Figure 1: anatomical urinary tract system.

Abbreviations

APN: acute pyelonephritis
ASB: asymptomatic bacteriuria
CKD: chronic kidney disease
CRF: chronic renal failure
CVA: cerebro vascular accident
DM: diabetes mellitus
EGFR: estimated glomerular filtration rate
ESR: erythrocyte sedimentation rate
ESRD: end-stage renal disease
FC: Foley Catheter
GFR: glomerular filtration rate
GP: general practitioner
HHCS: home healthcare service
IM: intramuscular
IV: intravenous
NHS: National Health Service
LUTI: lower urinary tract infection
LRTI: lower respiratory tract infection
RBC: red blood cells
SPC: suprapubic catheter
SPA: suprapubic aspiration
UTI: Urinary tract infection
WBC: white blood cell
WHO: World Health Organization

Introduction

Urinary tract infection (UTI) : By definition urinary tract infection, or UTI, means any infection that can affect any part of the urinary tract, which involves :

1- Kidneys

2- Ureters - the tubes that take urine from each kidney to the bladder.

3- Bladder

4- Urethra - the tube that empties urine from the bladder to outside.

Or it can be so defined: is the presence of pathogenic bacteria in the urine, urethra, bladder, kidneys or prostate. The Public Health Laboratory Service uses the criteria of 10 bacteria which are present in the urine for a diagnosis(1)

Urinary tract infection (UTI) , & lower respiratory tract infection (LRTI) are the most common problems in the elderly. Sometimes there is misdiagnosis between those two problems, and a lot of elderly patients are diagnosed as having LRTI or UTI or even both but these diagnoses are not confirmed.

The most important cause for this problem is that many elderly patients are unable to give a definite clinical history suggestive of LRTI or UTI, because they are often confused at the time of presentation. In such conditions the correct diagnoses are the corner stone in the management .This required a good clinical examination and investigation, to differentiate between these two problems.

Urinary tract infections are very common problems in general practice in all age groups, but it is more common in elderly people, with a prevalence of approximately 20% in women over 65 years old. Women have a greater prevalence than men, but the trend to increase prevalence with age in over 65 year olds is greater in men(2). This may be contributed to by many factors:

1. Immunosuppression.
2. Underlying chronic medical illnesses like DM, HTN, RF
3. Urinary and fecal incontinence.
4. Depressed mental state like dementia, delirium.
5. Associated use of devices such as urinary catheters and nasogastric tubes.
6. Medications that suppress the immune system or the central nervous system (polypharmacy).
7. Advanced age.
8. Factors that promote person-to-person transmission such as crowding and sharing of meals(3).
9. Mechanical changes involving the bladder and urethra, such as increased post void residual urine, or that allow bacterial attachment .
10. Prostatic enlargement in men .
11. Decreased estrogen in postmenopausal women.
12. Not drinking enough fluids(4).

The diagnosis of UTI in adult patients depends on the history and the physical examination. The most common signs and symptoms of UTI are fever and/or chill, dysuria (burning sensation of urine), pyuria, frequency, urgency, Hematuria Colicky pain and incontinence. Cloudy urine, foul or strong urine odor, pressure in the lower pelvis.

Diagnosis of UTI in confused elderly patients or those who cannot express themselves is usually very difficult , and sometimes may present in different ways; that is the signs or symptoms are not related, like a patient who presented with hallucination, disorientation, agitation.

The most important challenge for physicians in long term care setting is that under what conditions can they give antibiotic as a treatment for possible UTI in case of acute behavioral changes of demented patients or those who cannot report classical symptoms of UTI , which can help in making possible diagnosis.

In practice some demented elderly patients present with acute behavioral changes like agitation; most of them febrile. Those patients showed a significant improvement when they were treated for UTI with antibiotic.

The perfect management of UTI in elderly patients is very important, because it considers a serious infection and carries a big chance for severe complications. UTI in elderly patients usually differs significantly from that which occurs in the general population, in its etiology, clinical signs & symptoms, and treatment.

Definitions

1. **Urinary tract infection** means presence of pathogenic bacteria in the urine, urethra, bladder, kidneys, or prostate.
2. **Recurrent UTI** - Repeated episodes of infection (three or more/year) by different causative microorganism.(5)
3. **Relapse** - Repeat UTI with the same strain of microorganism within two weeks. This can be called failure of the treatment.
4. **Bacteriuria** is presence of bacteria in urine revealed by microscopy or by quantitative culture. Significant Bacteriuria equal to or more than 10⁵ cfu/ml of a single

bacterial species in a freshly voided specimen of urine.

a- women with symptomatic UTI \geq 10² cfu/ml .

b- men \geq 10³ cfu/ml (if 80% of the growth is due to a single organism).(6)

5. Asymptomatic bacteriuria means presence of bacteria in the urine with no signs or symptoms, discovered microscopically in sample taken from patient's urine or by urine culture.
6. Bacteraemia means presence of bacteria in the blood and it is diagnosed by blood culture.
7. Empirical treatment of UTI is a treatment based on clinical symptoms or signs unconfirmed by urine culture.
8. Haematuria: it is presence of blood in the urine either visible (macroscopic haematuria) or invisible (microscopic haematuria) .
9. Catheterization: an indwelling catheter is inserted through urethra or suprapubic temporarily or permanently.
10. Short term catheter is an indwelling catheter left in place for 1-7 days.(7)
11. Long term catheterization is an indwelling catheter left in place for more than 4 weeks.
12. Pyuria : means number of white blood cells (WBC)/ml equal or more than (10⁴ cells) per milliliter of urine freshly voided.
13. Asymptomatic, abacteriuric patients: that means Pyuria without bacteriuria and this is most likely due to a foreign body, like urinary catheter, stones or neoplasms of urinary tract, lower genital tract infection.
14. Dysuria : means painful urination, or burning or stinging sensation and it is sometimes described as difficulty of urination. This is the most common symptom of lower UTI(8).

Background

Subject: Retrospective Study of urinary tract infection (UTI) in geriatric patient under Homecare services for the last year from 1st September 2010 until 1st September 2011.

Goals of the study

In this proposal we will try to focus / on urinary tract infection to old age patients who live in their houses under home care services.

- 1 To determine the prevalence of urinary tract infection of the geriatric patients .
- 2 To identify the possible underlying risk factors which may be related, to cause UTI.
- 3 To recognize the most common organism.
- 4 To determine the most appropriate antibiotic for these organisms.

Epidemiology

PLACE: QATAR / DOHA/ HOMECARE

PATIENTS NUMBER: 614

DATE: 1st September 2010- 1st September 2011

METHOD OF COLLECTION OF DATA: PATIENT FILES AND/ OR MEDICOM.

DURATION: 6 MONTHS

Collection data started at October 2011 retrospectively For last year (1st September - 1st September 2011) .

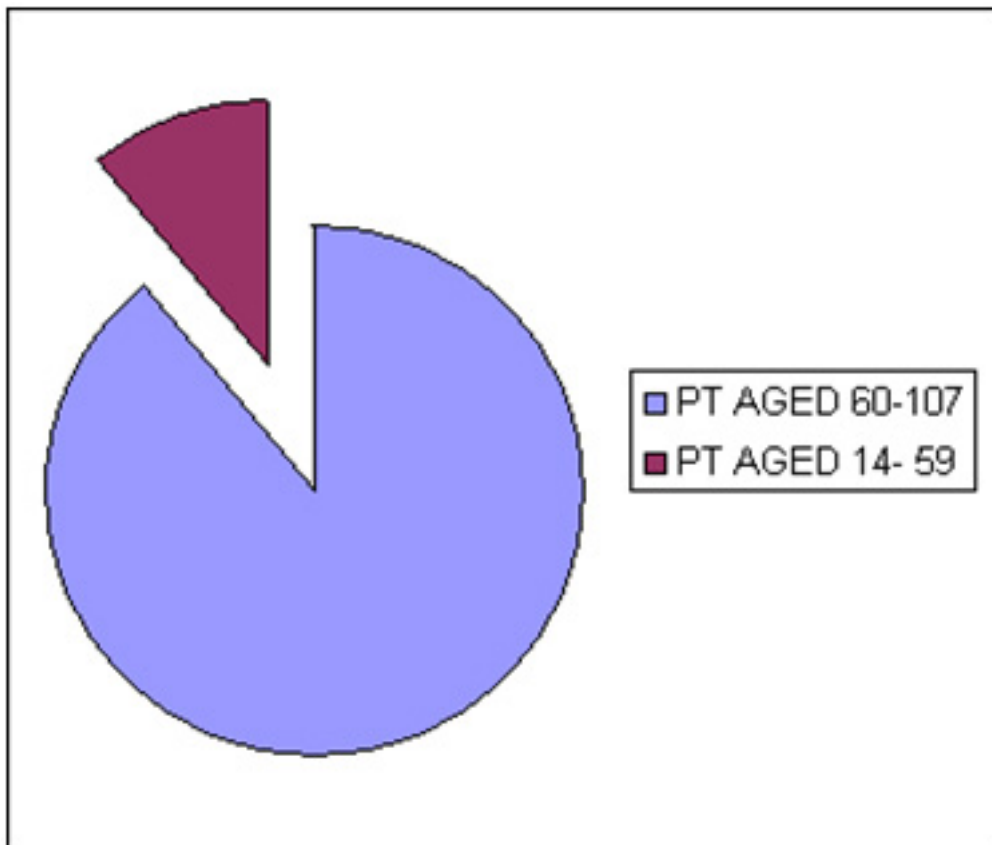


Figure 2: Distribution of patients according to age

Total patients under home care for this period was 614 patients, most of them were old age.

The ages were between 14-107 years.

67 patients aged between 14 -59 = 12.24%

547 patients aged between 60-107 = 87.76%

Figure 3: distributed patients according to gender :

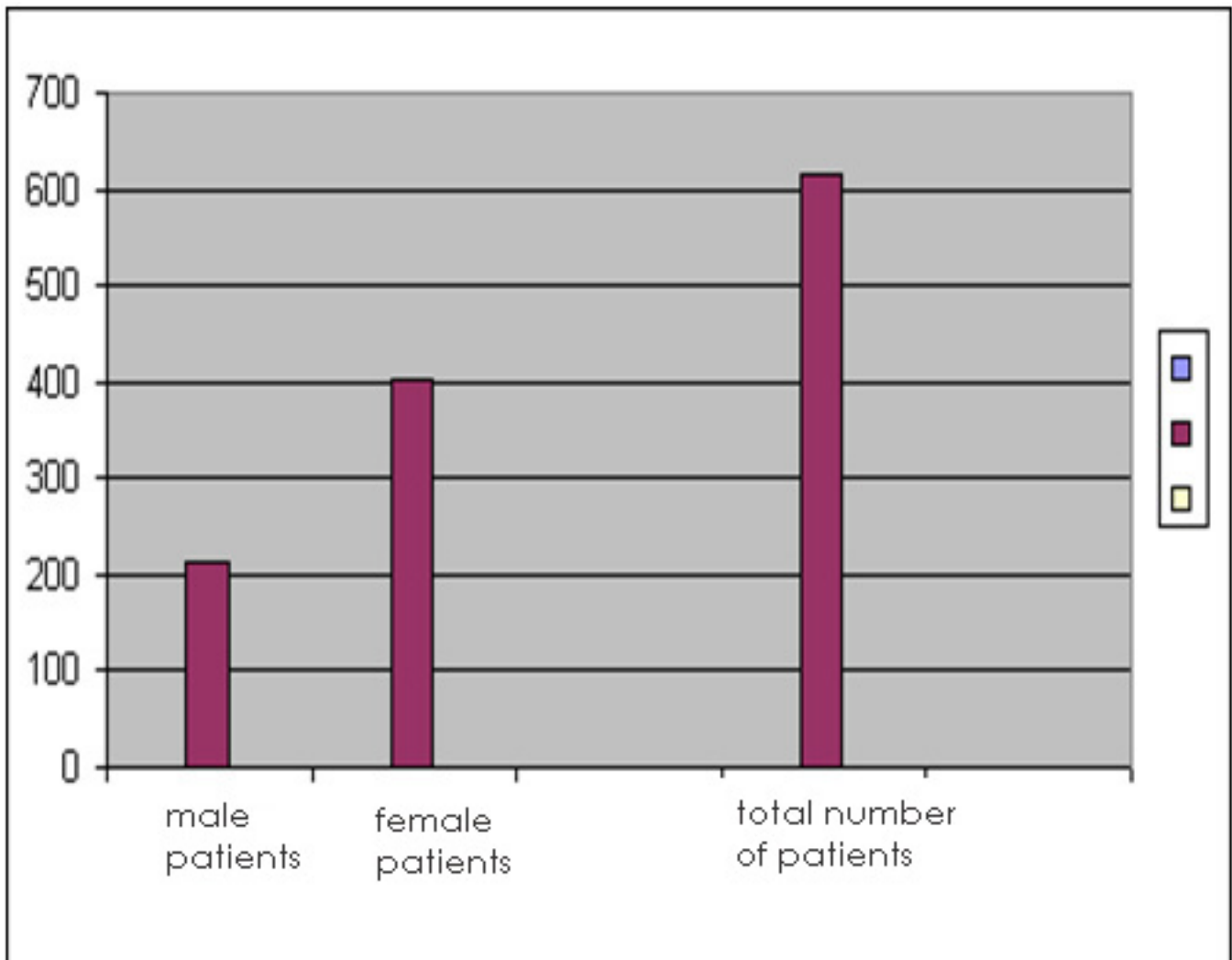


Figure 3 (previous page) shows the distribution of patients according to their genders.

Total number of patients : (614)

Male patients : (212)

Female patients : (402)

In this diagram we will try to show the distribution of patients according to their nationalities:

QATARI	541
NON QATARI	73
1- PALESTINE	20
2- BAHRAIN	10
3- PAKISTAN	6
4- IRAN	6
5- SUDAN	5
6- YEMEN	5
7- UAE	4
8- JORDAN	3
9- SOMALIA	3
10- UK	2
11- USA	2
12- BANGLADESH	2
13- PHILIPPINES	2
14- CANADA	1
15- SUDAN	1
16- OMAN	1

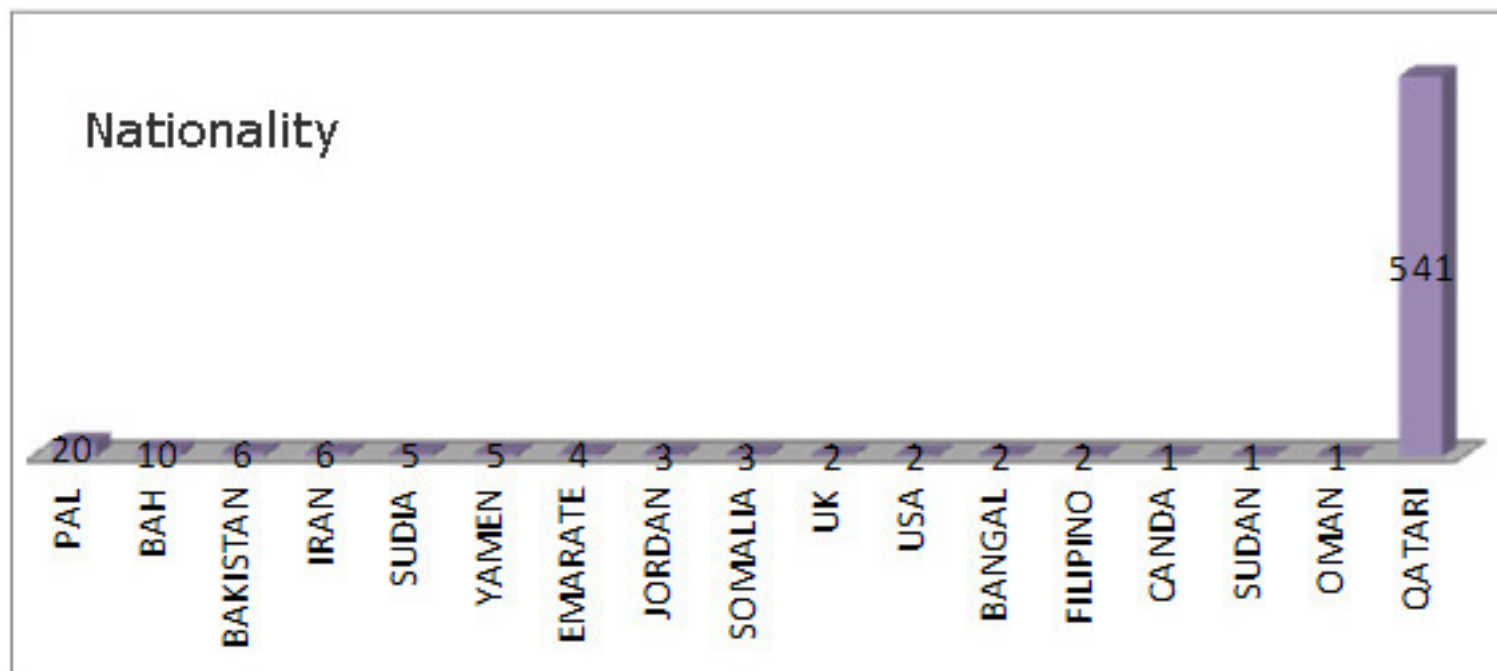


Figure 4: patients according to nationality

Methods

We traced electronic medical records and patients' files during last year to collect these data. We depended on result of urine culture and urine analysis.

Results and Statistical Analysis

During data collection we found a lot of valuable things.

Here we will mention the most important findings :

A :

None of total number of patients suffered from UTI 131.

Two (2) patients were on intermittent catheter.

Three(3) patients were on condom catheter.

Five(5) patients were on suprapubic catheter.

Twenty nine(29) patients on Foley catheter.

Total catheterization patients had UTI (38).

This / means that 29% of total no. of UTI patients.

This means as we mentioned above, catheterization considered as an important risk factor for UTI, and increases the chance of infection.

All chronic catheter users have bacteriuria. Its treatment does not improve mortality or morbidity but does increase the risk of antibiotic-related side effects and the development of infection with resistant organisms .(9)

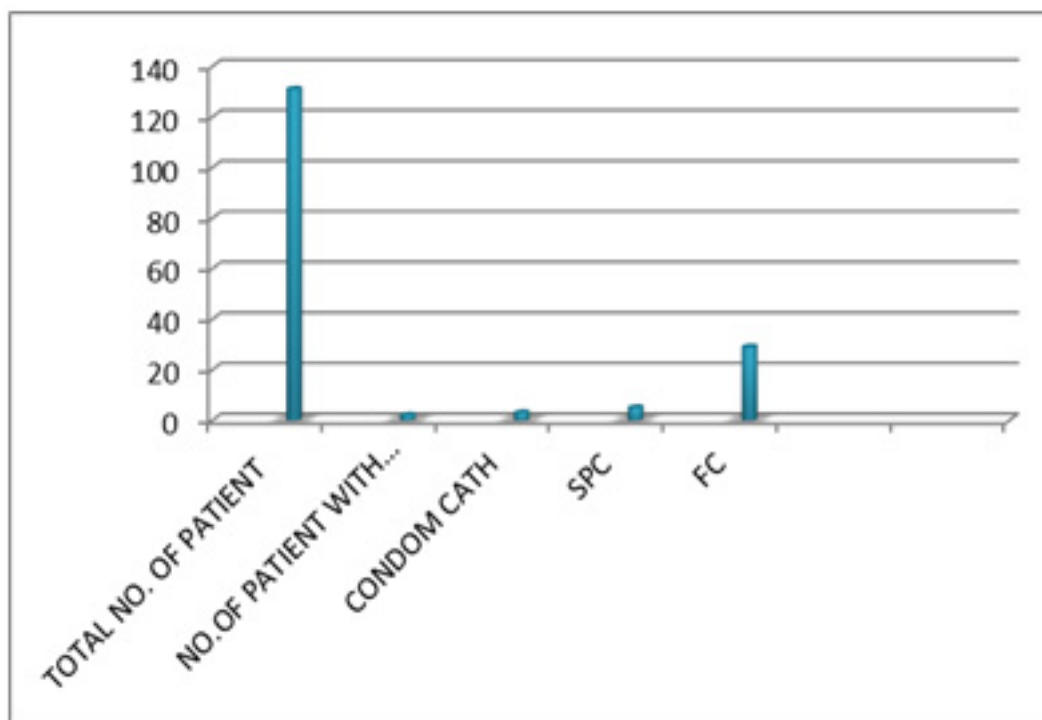


Figure 5: catheterization patients

B : Causative microorganism :

a- E coli , it was the most common microorganism

(57 patients) i.e 42.5% of total patients who suffered from UTI .

b- 2nd common causative organisms :

They were

1- pseudomonas aeruginosa.

2- klebsiella ssp.

3- enterococcus faecalis.

These three organisms affected 36 patients.

About 27.27% of UTI patients. (12) had all of them.

These microorganisms form about 70% of total patients suffering from UTI in this study. This is supported by A retrospective analysis of urine culture results issued by the microbiology department, Teaching Hospital, Karapitiya(10)

The common etiological agents are Escherichia coli, Pseudomonas spp., Proteus spp., Klebsiella spp. and Enterococcus spp.

- c- Mixed growth : 16 urine samples of patients showed mixed growth.
- d- No growth : 7 urine samples showed no micro organism had been found .
- e- fungal infection especially candida ssp plays a role in this problem
Candida ssp grows from 7 urine samples that had been taken from patients. All of them females
- f- the rest of causative organisms varied (5 patients) acitinebacter buammanii, Citrobacter koseri' & streptococcus feacalis , are affected (2 patients) for everyone of them.
- g- others : (3 patients) other organism.

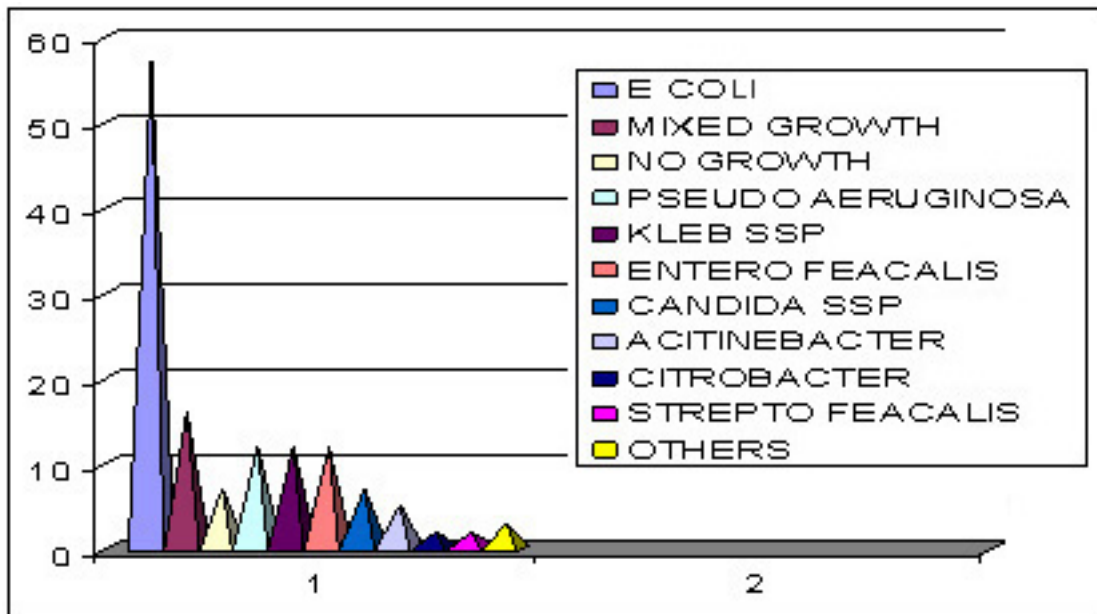


Figure 6: organisms found in urine culture samples.

C : In the table below we choose more common causative organisms of UTI. and sensitivity and resistance. (E COLI , KLEPS ssp , ENTEROCOCCUS feacalis, PSEUDO MONAS aeruginosa)

These organisms form around 70% of cases.

- 1st
 - a- Ecoli (54 cases) 53 cases of them sensitive to nitrofurantion, only one case is resistant. 28 cases (50% of cases) sensitive to septrin, 22 of cases (40%) sensitive to Tazocin.
 - b- 32, 34, 38 cases, ie about (60% - 70% of cases) are resistant to (cephalothin augmentin, ampicillin) respectively.

		E.COLI		KLEPS SSP		ENTERO feacalis		PSEUDO Aeruginosa	
ANTIBIOTIC		S	R	S	R	S	R	S	R
1	NITROFURANTION	53	1	7	5	-	-	-	1
2	CIPROFLOXACIN	14	25	6	6	8	4	12	-
3	TAZOCIN	22	5	3	-	-	-	12	1
4	AMPICILLIN	12	38	3	9	9	1	-	1
5	AUGMENTIN	10	34	8	4	-	1	-	1
6	SEPTRIN	28	16	1	1	3	1	1	1
7	CEPHALOTHIN	14	32	6	5	2	-	-	1
8	CEFUROXIME	15	14	5	7	-	2	-	12

2nd

(12 cases) of pseudomonas aeruginosa , 100% of them are sensitive to Tazocin & ciprofloxacin .

3rd (12 cases) of enterococcus feacalis , (8, 9 of them) are sensitive to ciprofloxacin & ampicillin respectively .

4th (12 cases) of klepseilla ssp, (6, 7, 8) are sensitive to ciprofloxacin Nitrofurantion & augmentin respectively

D : UTIs associated with chronic medical problems.

70 patients from those who had UTI / suffered from DM for a long time. i e 53.43%

- 1- Diabetes mellitus is usually cited as increasing the risk of infection all over the body
- 2- Patients with diabetes mellitus (DM) have an increased risk of UTI, but data explains truly linking a diabetic condition to infectious risk is still not enough and needs more studies in future.
- 3- Uncontrolled Hyperglycemia appears to affect the function of neutrophils with impairment of phagocytosis, chemotaxis/migration as well as intracellularlysis of organisms, and its affect on tissue perfusion leading to peripheral vascular disease and microcirculatory abnormalities.
- 4- Diabetic peripheral neuropathy is a risk factor for diabetic foot infection, Cellulitis and osteomyelitis,
- 5- Amputation in DM 15x > non-DM.
- 6- Patients with abnormal bladder function due to neuropathy are at higher risk of UTI.
- 7- In US, 10% of all hospital discharges have a DM diagnosis and therefore DM patients admitted more commonly than non-diabetic patients(11).

8- Pneumonia and UTIs are the most common causes of Diabetic ketoacidosis (DKA) and the hyperosmolar hyperglycemic state (HHS) .

9- Data supports increased risk of UTI or pyelonephritis, Candidal UTI, Candidal vulvovaginitis is still little and needs more and more.

E : 71 patients developed MDRO i.e 54.19% .

The prevalence of resistance in organisms isolated from UTI is well-recognized in old patients.

The mechanism of how organisms develop resistance to anti microbials is not fully clear.

A few researchers tried to clarify and evaluate the importance of potential factors contributing to resistance.

Some reports describe that resistance is derived from older populations in long term care facility (LTCFs)(12), But we still need more studies to answer many questions like :

- 1. *What is the prevalence of resistance?*
- 2. *Is resistance associated with increasing age?*
- 3. *What are other associations of resistance in older people ?*
- 4. *What is the appropriate management of UTI in older People known or suspected to have symptomatic Infection with a resistant organism?*
- 5- *Do older individuals with UTI with resistant organisms have a poorer outcome than those with susceptible organisms?*
- 6- *How should bacterial resistance in UTI in older people be defined?*

(From: Resistant Pathogens in Urinary Tract Infections) Lindsay E. Nicolle, MD JULY 2002-VOL. 50, NO. 7, SUPPLEMENT)

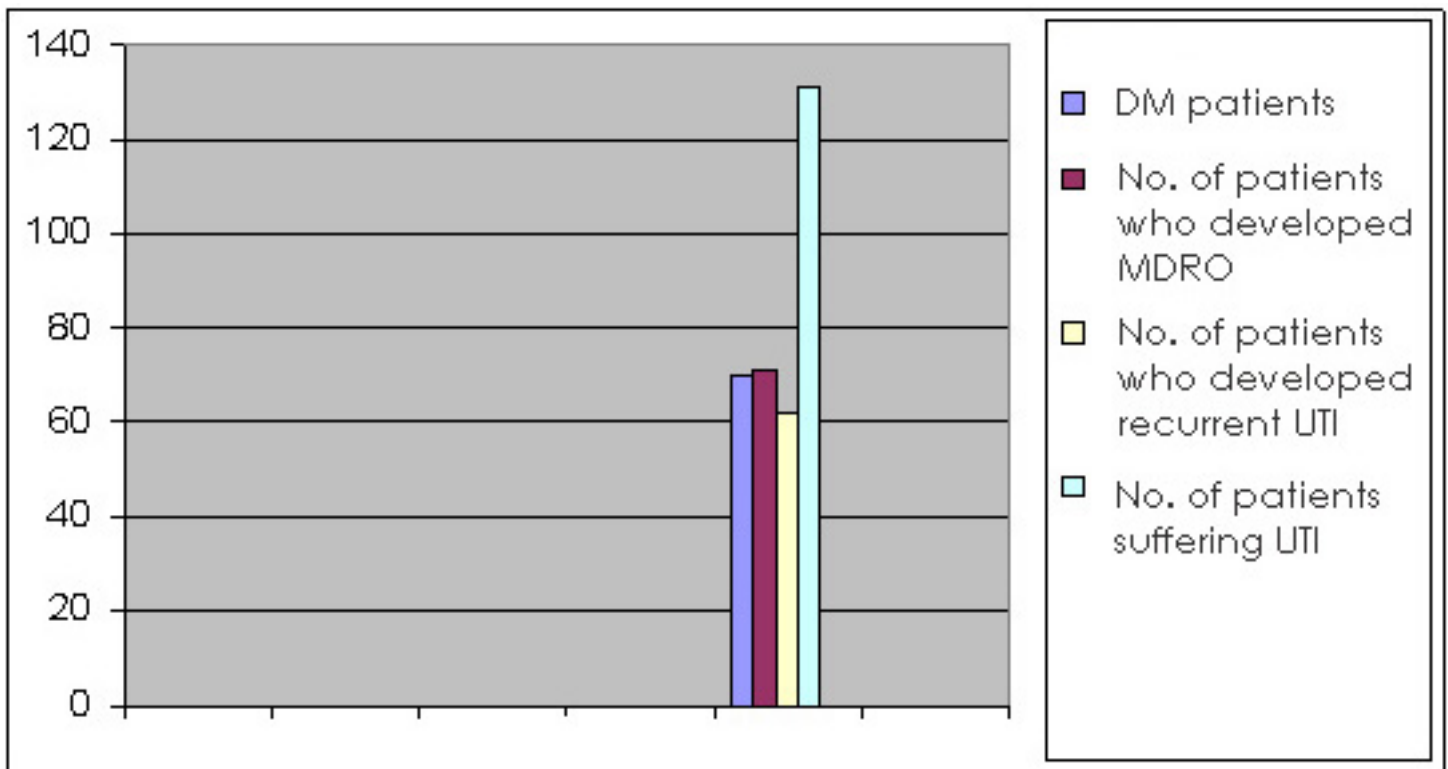


Figure 7: UTI associated DM patients

F: 62 patients suffered from recurrent UTI (relapse 10 cases) .

G : -in 53 patients WBC in blood increased (10.700- 31.000) 4 cases showed decrease in no. of WBC less than normal.

H : only 62 urine analyses had been done, 64.51 % of them support the diagnosis of UTI .

I: This slide will show us percentage distribution of males to females suffering from UTI:
 1- 39 male patients suffered from UTI, this means that 18.39% of total No. of male patients,
 2- 92 female patients suffered UTI , this means that 22,88 % of total No. of female patients.

*Women suffered with UTI more than men; this fact has been proved by a lot of studies, but the causes are still not clear

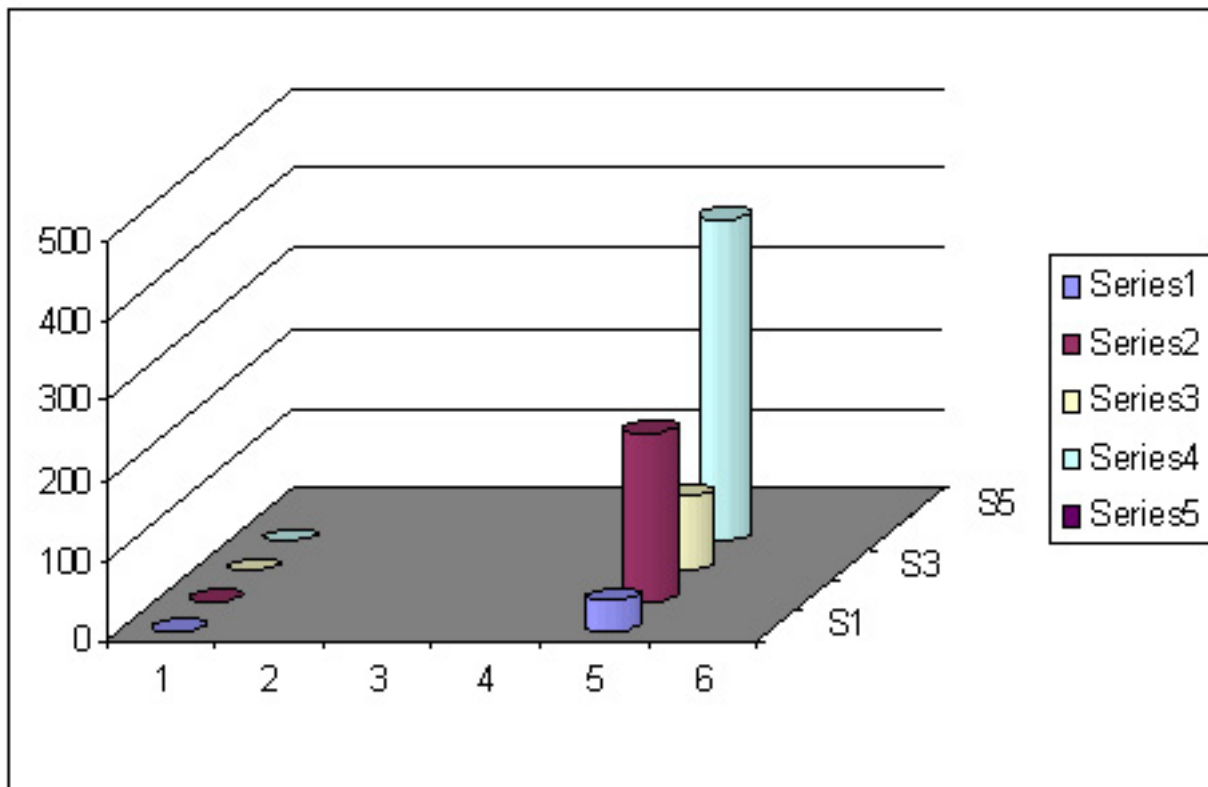


Figure 8: Males to females patients

J : The most antibiotics used in the treatment of UTI were as following:

1	ciprofloxacin tab 500 mg oral bid 7- 14 days	39
2	ceftriaxone 2 gr vial iv once daily 5-10 days	27
3	tazocin 2.250- 4.5 vial iv gr tid 5-10 days	23
4	cefuroxime tab 250- 500 mg oral bid 7-14 days	14
5	Azithromycin 250 -500 mg od oral 3-7 days	10
6	Augmentin tab 625mg oral bid 10- 14 days	10
7	Meropenem & Ertapenem 0,5-1 gr bid or tid according to creatinine serum iv 7- 10 days	7
8	Cefepime 1-2 gr iv bid 7- 10 days	5
9	Nitrofurantoin tab 100mg bid oral 7 days	4
10	Seprtrin tab 960 mg bid oral 7-10 days	4
11	Others	7
12	No treatment	9

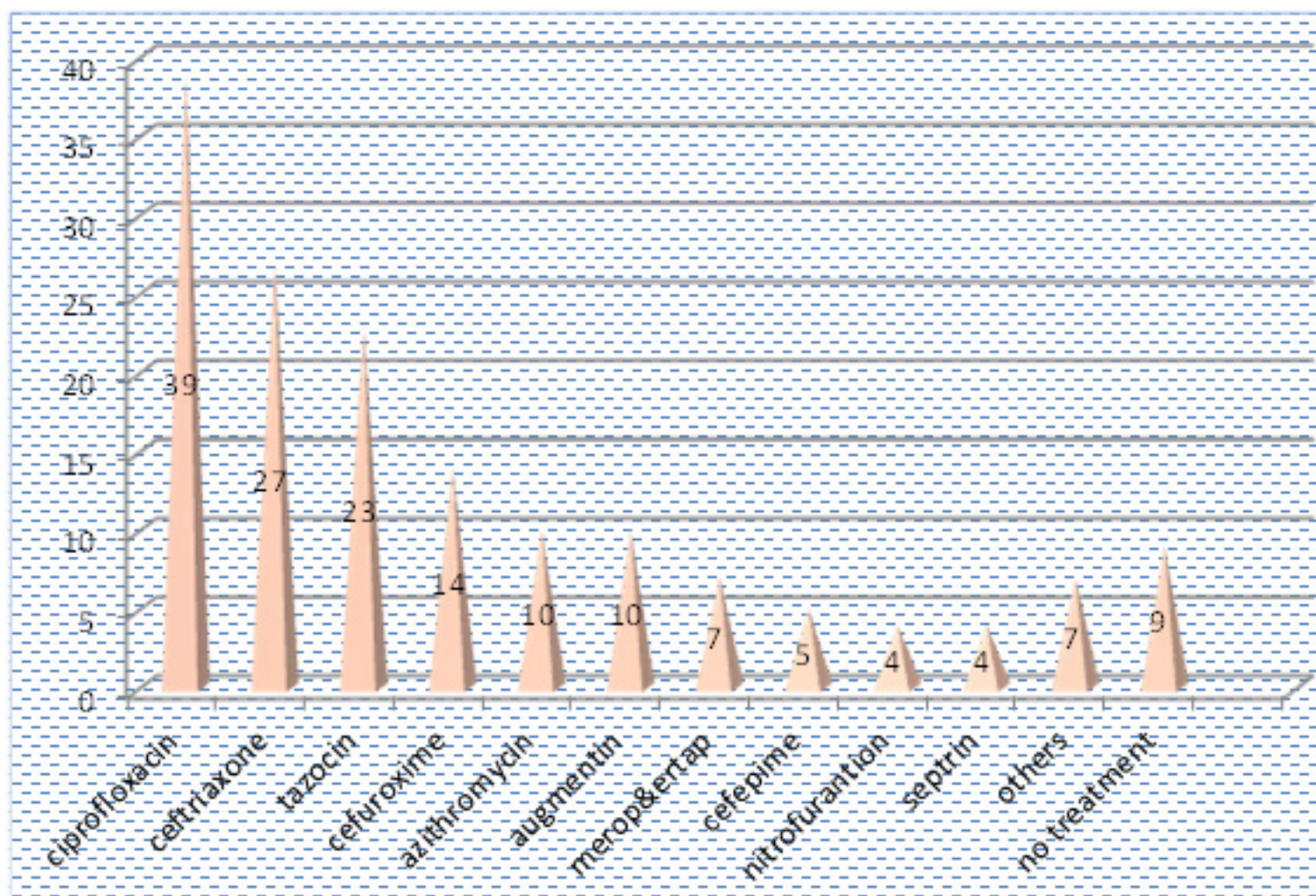


Figure 9: Antibiotics most used in treatment of UTI

Summary

- The prevalence of resistant bacteria causing urinary tract infection (UTI) from antimicrobials has increased in the last decades especially in elderly patients in the community.
- Patients in long-term care facilities, are more liable to develop this problem than others .
- Resistant bacteria isolates include common uropathogens, such as Escherichia coli and organisms with higher levels of intrinsic resistance, such as Pseudomonas aeruginosa(13).
- It is essential to send urine specimens for culture and susceptibility before starting antimicrobial therapy. This gives the clinician a chance to select specific antimicrobials for causative organisms and avoids empirical therapy which is usually broad-spectrum antimicrobial.
- Antimicrobial therapy should be avoided unless there is a clear clinical indication.
- Generally speaking asymptomatic bacteriuria should not be treated with antimicrobials.
- In case empirical therapy is essential, before isolated organisms recent antimicrobial therapy is the drug of choice until result of culture is available .
- Within (48- 72 hours) empiric therapy must be reassessed.
- UTI is commonly over diagnosed and over treated on the basis of nonspecific clinical signs and symptoms .(14)
- Urinary tract infections are a very common presentation in general practice in all age groups, with or without catheters(15),
- The risk of infection will be increased if there is any urological problem like abnormal structure of the urinary tract
- Incomplete bladder emptying and urinary stasis increases the incidence of bacteriuria especially with increasing age and disability.(16)
- A high percentage of patients with indwelling catheters (IDC) acquire bacteriuria each day even with the application of best practice for insertion and care of the catheter.
- In general, acute uncomplicated lower UTI is usually due to one organism like Ecoli, or streptococcus ssp (90-95%)(17)
- In patients with repeated infection, instrumentation or recent hospitalization, MDRO must be suspected.(18)
- All patients with long-term catheters are bacteriuric with urine samples and usually positive for two or more organisms.
- Urinary tract infections (UTI) are the most common infections acquired in hospitals and long-term care facilities. Early studies estimate the incidence of healthcare associated UTIs at around 2-3 patients per 100 admissions and this is supported by the more recently published Plowman Report. (Plowman et al, 1999)(19)

- Recently a number of risk factors for healthcare associated UTI have been established. The most important predisposing factor for healthcare associated UTI is the presence of an indwelling urethral catheter, and chronic medical problem like DM (70 patients of 131) as shown in our research .
- In elderly women (over 65 years of age), treatment of asymptomatic bacteriuria does not reduce mortality or significantly reduce symptomatic episodes. so no need to treat these cases.

Harrison edition 16 2005 page 1718 .
 (Plowman et al, 1999) .
www.whfoods.org

Prevention

- 1- Drink plenty of water is an important prevention strategy.
- 2- Wipe from front to back.
- 3- Keep genital area clean and dry.
- 4- Do NOT drink fluids that irritate the bladder, like alcohol and caffeine.
- 5- Drink cranberry juice or use cranberry tablets, but NOT if you have a personal or family history of kidney stones(20).
- 6- Use of low-dose antibiotics like Nitrofurantoin 100mg once daily on a daily basis may be recommended to prevent UTIs if patient gets frequent infections.
- 7- A good control of DM and treatment of other chronic problems may play a role in decreased chance of getting UTI .
- 8- Frequent emptying of the bladder and prevention of congestion of urine is important to prevent growth.
- 9- Care giver must be able to pick up any changes in patient behavior.
- 10- Early treatment of symptomatic patients with UTI as soon as possible can be prevent more complications .

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