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HOSPITAL PREVALENCE OF HIP FRACTURE IN OLD AGE PATIENT AND ANALYSIS OF CO MORBID RISK FACTORS.

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Abstract:
Objectives: Our research aims to determine the prevalence of hip fractures presenting in King Fahad hospital and to analyze the co-morbidities that leads to delay in surgery after admission.
Methods
A cross-sectional study, using a specific questionnaire for data collection. Patient who aged 60 or more were included in the study. Data gathered from the patients admitted at orthopaedic department in King Fahad Hospital and follow up until the day of surgery. Statistical Packages for Social Sciences (SPSS) version 20 had been used to conduct all statistical analyses for this project.
Results: A total of 177 responses had been collected from the patients, 99 (55.9%) were females and 78 (44.1%) were males. Regarding the age, 100 (56.5%) were less than 75 years and 77 (43.5%) were 75 years old or more. Majority of them had shown presence of heart disease (46.3%), other chronic diseases such as anemia stroke, bronchial asthma, osteoporosis and cardiomyopathy were shown but in relatively low percentage. Further findings of our study shows that there is a significant relationship between duration of admission and patients with diabetes (p-0.049).
Conclusion: This study provides insights on the prevalence of hip fracture of older patients and its associated diseases. Among them, were diabetes, hypertension, heart disease, anemia, stroke, osteoporosis and cardiomyopathy. We also described diabetes as the likely risk factor to cause the delay of surgery for hip fractured patients. To avoid further complication, orthopaedic personnel have to take prompt care for patients with these associated co-morbidities.
Keywords: *Hip fractures, Osteoporosis, Diabetes.*

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INTRODUCTION:

Hip fracture is defined as the femoral fracture that occurs the hip joint and 5 cm below the distal part of the lesser trochanter. In Saudi population, the incidence of proximal femoral fractures of patients aged 50 years or above was 5.89/1000. (1) It's reported that 17.5% of female and 6% of male will experience hip fracture .(2,3) A study to assess the incidence rate for hip fractures in Saudi Arabia found that nearly 6 out of 1000 patients aged over 50 presented with it.(4) It's reported that hip fractures are associated with 20-35%   probability of death during the first year after the fracture occur . (5) Hip fracture incidence increases with age due to higher rate of osteoporosis and falls in the population of elderly.(6) Hip fractures represent the most concerning complication of osteoporosis, as it can lead to decreased mobility which affects quality of life, in addition to increased mortality.(7) Osteoporosis is caused by decreased bone mass, this leads to bones becoming weaker and some of them, especially the hip, wrist, spine, humerus become more susceptible for fractures.(8) In Saudi Arabia, a study showed that 30.7% of men and 34% of women aged 50-80 years have osteoporosis.(9) In addition to the effect on quality of life and increased mortality, there is a significant increase in healthcare costs and social difficulties related to hip fractures, as long-term care facilities used to manage these patients in other countries are not available in Saudi Arabia.(10)

Fracture risk factors include: age above 50 years, Low body mass index, smoking, walking disability, several medication, and a family history of fracture.(11) Cohort studies have linked type 2 diabetes, cardiovascular disease, hypertension in men.(11) The WHO develop an assessment tool (FRAX) that predicts an individual's 10-year fracture risk on the basis of BMI in both men and women .(11) Also, the Garyan fracture risk calculator.(11)

Our research aims to determine the prevalence of hip fractures presenting in King Fahad hospital and to analyze the co-morbidities that leads to delay in surgery after admission, as it's the main center for trauma management in Medina.

The reason for this research project is the high prevalence of hip fractures in the Saudi population and to identify the main risk factors associated with it and to decrease the mortality rate in addition to healthcare costs in the Saudi population in general and Medina population in particular.

METHODOLOGY:

A cross-sectional study, using a specific questionnaire for data collection was designed. Patient who aged 60 or more were included in the study. Data gathered from the patients admitted at orthopaedic department in King Fahad Hospital and follow up until the day of surgery. Statistical Packages for Social Sciences (SPSS) version 20 had been used to conduct all statistical analyses for this project. Descriptive analysis had presented as numbers and percentages for all categorical variables and mean ± standard deviation was used to summarize all continuous variables. The analyses that measure the relationship between socio-demographic and other related variables in the survey by using chi-square test. P-value 0.05 has been accepted as the significant level for all statistical tests.

Statistical analysis method

Statistical Packages for Social Sciences (SPSS) version 20 had been used to conduct all statistical analyses for this project. Descriptive analysis had presented as numbers and percentages for all categorical variables and mean ± standard deviation was used to summarize all continuous variables. The analyses that measure the relationship between socio-demographic and other related variables in the survey by using chi-square test. P-value 0.05 has been accepted as the significant level for all statistical tests.

RESULTS:

Table 1: Description of socio demographic variables based on age group and gender

Study Variables	Overall (n=177) N (%)	Age group <75 years (%) (n=100)		Age group ≥75 years (%) (n=77)	
		Male (n=41) N (%)	Female (n=59) N (%)	Male (n=37) N (%)	Female (n=40) N (%)
Classification of BMI					
• Normal	98 (55.4%)	22 (53.7%)	24 (40.7%)	23 (62.2%)	29 (72.5%)
• Overweight	47 (26.6%)	17 (41.5%)	18 (30.5%)	07 (18.9%)	05 (12.5%)
• Obese	32 (18.1%)	02 (04.9%)	17 (28.8%)	07 (18.9%)	06 (15.0%)
Duration from admission to surgery					
• Short (<7 days)	148 (83.6%)	32 (78.0%)	49 (83.1%)	34 (91.9%)	33 (82.5%)
• Long (≥7 days)	29 (16.4%)	09 (22.0%)	10 (16.9%)	03 (08.1%)	07 (17.5%)
Is patient diabetic?					
• Yes	42 (23.7%)	10 (24.4%)	12 (20.3%)	11 (29.7%)	09 (22.5%)
• No	135 (76.3%)	31 (75.6%)	47 (79.7%)	26 (70.3%)	31 (77.5%)
Is patient hypertensive?					
• Yes	54 (30.5%)	09 (22.0%)	16 (27.1%)	12 (32.4%)	17 (42.5%)
• No	123 (69.5%)	32 (78.0%)	43 (72.9%)	25 (67.6%)	23 (57.5%)
Does the patient have HF?					
• Yes	25 (14.1%)	04 (09.8%)	07 (11.9%)	06 (16.2%)	08 (20.0%)
• No	152 (85.9%)	37 (90.2%)	52 (88.1%)	31 (83.8%)	32 (80.0%)
Is patient smoker?					
• Yes	29 (16.4%)	07 (17.1%)	07 (11.9%)	08 (21.6%)	07 (17.5%)
• No	148 (83.6%)	34 (82.9%)	52 (88.1%)	29 (78.4%)	33 (82.5%)
Does the patient drink?					
• Yes	01 (0.6%)	0	01 (01.7%)	0	0
• No	176 (99.4%)	41 (100%)	58 (98.3%)	37 (100%)	40 (100%)

A total of 182 responses were collected from the patients to whom 5 of them had been excluded as they did not meet the inclusion criteria. Of the 177 participants, 99 (55.9%) were females and 78 (44.1%) were males. The age range was from 60 to 101 years old of which, 100 (56.5%) were in the age group of less than 75 years and 77 (43.5%) were in the age group of 75 years or more. Further details of demographic characteristics of patients were presented at Table 1.

Table 2: Prevalence of Participants' Chronic Illness

Chronic Illness	N (%) (n=177)
• Heart disease	82 (46.3%)
• Osteoporosis	47 (26.6%)
• Risk of venous thromboembolism	44 (24.9%)
• Chronic Kidney Disease	37 (20.9%)
• Anemia	32 (18.1%)
• Cardiomyopathy	21 (11.9%)
• Stroke	13 (07.3%)
• Bronchial Asthma	10 (05.6%)
• ESRD	04 (02.3%)
• Other	12 (06.8%)

Table 2 shows the prevalence of chronic illness of patients where majority of them was Heart diseases (46.3%) other chronic diseases such as osteoporosis, risk of VTE, chronic kidney disease, anemia, cardiomyopathy, stroke, asthma and ESRD were also shown but in relatively low percentage.

Table 3: Relationship between the duration from admission to surgery versus socio demographic and health characteristics among [(n=177)]

Characteristics	Short Duration (n=148) N (%)	Long Duration (n=29) N (%)	P-value [§]
Gender			
• Male	66 (44.6%)	12 (41.4%)	
• Female	82 (55.4%)	17 (58.6%)	0.750
Age group in years			
• <75 years old	81 (54.7%)	19 (65.5%)	
• ≥75 years old	67 (45.3%)	10 (34.5%)	0.284
Classification of BMI			
• Normal	85 (57.4%)	13 (44.8%)	
• Overweight	37 (25.0%)	10 (34.5%)	0.439
• Obese	26 (17.6%)	06 (20.7%)	

Is patient diabetic?

• Yes	31 (20.9%)	11 (37.9%)	**0.049 ****
• No	117 (79.1%)	18 (62.1%)	

Is patient hypertensive?

• Yes	43 (29.1%)	11 (37.9%)	0.342
• No	105 (70.9%)	18 (62.1%)	

Patient Chronic diseases

• Heart diseases	71 (48.0%)	11 (37.9%)	0.321
• Osteoporosis	43 (29.1%)	04 (13.8%)	0.089
• Risk of venous thromboembolism	33 (22.3%)	11 (37.9%)	0.075
• Chronic Kidney Disease	31 (20.9%)	06 (20.7%)	0.975
• Anemia	25 (16.9%)	07 (24.1%)	0.354
• Cardiomyopathy	19 (12.8%)	02 (06.9%)	0.366
• Stroke	09 (06.1%)	04 (13.8%)	0.145
• Bronchial Asthma	07 (04.7%)	03 (10.3%)	0.231
• ESRD	02 (01.4%)	02 (06.9%)	0.066

SD – Standard Deviation. §P-value has been calculated using chi-square test. ** Significant at p≤0.05 level.

We used chi-square test at table 3 to measure the relationship between socio demographic characteristics and duration from admission to surgery with p-values which indicates whether the relationship is statistically significant. A p value of ≤0.05 has been used as a cut off point for level of significance. Female was higher than male in both groups however, relationship was found to be negative (p-0.750). Age group of less than 75 years was superior in both group compared to 75 years or more and the test shows negative relationship (p-0.284). In classification of BMI, normal was higher among overweight and obese between each group and analysis revealed it was not statistically significant (p-0.439). With regards to patient diabetic, those patients without DM were higher on both ends in comparison to patient with DM and the result shows positive relationship (p-0.049). Hypertension (HTN) also shows, patients without HTN were higher in each group compared to those patient with HTN and the results revealed no relationship between the duration (p-0.342). In relation to patient chronic illness, majority was heart diseases, but we failed to prove its relationship to the group of duration, other chronic illness found on the patients found to be not statistically significant.

Table 4: Regression analysis to predict long duration among the socio demographic and health characteristics of patients (n=177)

Characteristics	Odds Ratio	95% CI	P-value §
Gender			
• Male	Ref		0.750
• Female	1.140	0.509 – 2.555	
Age group in years			
• <75 years old	Ref		0.286
• ≥75 years old	0.636	0.277 – 1.461	
Classification of BMI			
• Normal	Ref		
• Overweight	1.509	0.522 – 4.366	0.448
• Obese	0.854	0.276 – 2.642	0.784
Is patient diabetic?			
• Yes	Ref		**0.053 ****
• No	0.434	0.186 – 1.013	
Is patient hypertensive?			
• Yes	Ref		0.344
• No	0.670	0.292 – 1.537	
Patient Chronic diseases			
• Heart disease (Yes vs No)	1.509	0.667 - 3.414	0.323
• Osteoporosis (Yes vs No)	2.560	0.841 – 7.794	0.098
• Risk of venous thromboembolism (Yes vs No)	0.470	0.202 – 1.092	0.079
• Chronic Kidney Disease (Yes vs No)	1.016	0.380 – 2.711	0.975
• Anemia (Yes vs No)	0.639	0.246 – 1.657	0.357
• Cardiomyopathy (Yes vs No)	1.988	0.437 – 9.045	0.374
• Stroke (Yes vs No)	0.405	0.116 – 1.416	0.157
• Bronchial Asthma (Yes vs No)	0.430	0.104 – 1.772	0.243
• ESRD (Yes vs No)	0.182	0.025 – 1.370	0.099

CI – Confidence Interval. ** Significant at p≤0.05 level.

Binary regression analysis shows patient with DM has significant effect on the long duration of surgery (odds ratio 0.434, p-0.053) where DM patients are likely to have 33% decline to be in the long duration of surgery compared to those without DM. Other variables included in the model shows no significant influence in the long duration of surgery.

DISCUSSION:
The main objectives of our study were "to determine the prevalence of hip fractures presenting in King Fahad hospital and to analyze the co-morbidities that leads to delay in surgery after admission." The findings of this study shows, a total of 177 patients were collected of whom were admitted for hip fracture surgery. Risk factor of the disease includes; Diabetes among 23.7%, hypertension among 30.5%, risk of venous thromboembolism among 24.9% with low percentages registered to heart disease, anemia, stroke, bronchial asthma, chronic kidney disease (CKD), osteoporosis, cardiomyopathy and End-Stage Renal Disease (ESRD). Further findings revealed that majority of them had short duration (83.6%) from admission to the day of surgery.

We also compare the two group of duration from admission to the day of surgery as short duration (<7 days) versus long duration (≥7 days) to validate whether any of the risk factors had caused the delay of surgery. Based on the results, patient with diabetes revealed significant relationship in the group of duration. We believe that we are the first paper to show this type of comparison here in Saudi Arabia as most of the paper published was about the prevalence of hip fractures and its associated risk factors.

In an article published by two researchers from Taif University, Taif, Saudi Arabia.[15] The topic was about "prevalence of factors that can increase the risk of hip fracture and its complication after surgery." They discovered that the prevalence of hip fracture was high at 65 – 74 years of age compared to other age categories. They also reported that 68 cases of osteoporosis had been registered as a risk factor of hip fracture. 35 cases with diabetes, 12 cases with anemia. This study results were somewhat higher at a certain point most especially regarding some association of co morbidities but we cannot further assess comparison of some chronic illness as the latter study had exhibited limited description on co morbidities. Another published study from Saudi Arabia revealed that hypertension, coronary artery disease, diabetes mellitus, endocrine diseases, stroke, family history of osteoporotic fracture, chronic kidney disease (CKD), dementia asthma and other prescriptive drugs were the risk factors of hip fracture. [16] In their study, these risk factors represented a small percentage and CKD, family history of osteoporosis with dementia shows significant relationship to hip fractures. Our study registered patients with higher numbers on DM,hypertension but in stroke and asthma both of our results were symmetrical in numbers. Furthermore, in the Northern part of Saudi Arabia, researchers reported that osteoporosis was associated with low vitamin D level along with calcium intake, diet and smoking among women above 40 years old.[17] Risk factors in this study was different from our study findings although in our study 16.4% were smokers nonetheless both of our study exemplified a comparable prevalence of the disease associated with its risk factors.

In Jordan, the prevalence of osteoporosis for women was 13.5%, among them 13% were associated with DM and 18% of them had hypertension and both co morbidities were statistically associated with osteoporosis.[18] The prevalence of the co morbidities in this project was slightly lower than the prevalence of DM and hypertension in our project, although their project focused on women as we were centered on older patients which gave distinction of each study outcome. Moreover in Korea, the prevalence of venous thromboembolism (VTE) among patients with hip fracture was 11.1% and it was associated with the following co morbidities such as, diabetes, hypertension, cardiac disease, pulmonary disease, cerebrovascular accident, cancer, dementia, thyroid disease, liver and kidney disease, previous VTE, varicose veins, previous anticoagulation treatment and dehydration.[19] The prevalence of VTE in our study was two times higher than the latter paper though associated co morbidities in their study were registered higher than our study result. However, in Europe, the prevalence of hip fracture was high on normal BMI and these groups of patients were mostly associated with DM, dementia and heart failure.[20, 21] We found the outcome of these two projects somewhat similar to our findings where we also demonstrated that normal BMI was higher in patients with hip fracture while this may vary on the proportion of BMI categories as normal categories was dominantly higher to both overweight and obese patients. Our study results also exhibited that DM was one of the main risk factor associated with hip fracture which was also unveiled in the above two European projects.

CONCLUSION:

The revelation of this study utterly supplemented previous published articles. It also provides additional insights on the prevalence of hip fracture of older patients and its associated diseases. Among them, were diabetes, hypertension, risk of venous thromboembolism, heart disease, anemia stroke, osteoporosis and cardiomyopathy. We also describe diabetes as the likely risk factors to cause the delay of surgery for hip fractured patients, although further investigations are needed in order to validate this claim. To avoid further complications, orthopaedic personnel have to take prompt care for hip fractured patients with associated co morbidities.

REFERENCES:

1. Kenneth E S Poole, Juliet E Compston. Osteoporosis and its management. BMJ 2006; 333():
    https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1702459/ (accessed).
2. Mir Sadat-Ali, Ibrahim M. Al-Habdan, Haifa A Al-Turki, Mohammed Quamar Azama . An epidemiological analysis of the incidence of osteoporosis and osteoporosis-related fractures among the Saudi Arabian population. Ann Saudi Med   2012;   32():
    http://www.annsaudimed.net/index.php/vol32/vol32iss6/367.html (accessed).
3. https://orthoinfo.aaos.org/en/diseases--conditions/hip-fractures
4. https://emedicine.medscape.com/article/825363-overview#a4
5. Hiligsmann M, Ethgen O, Richy F. Utility values associated with osteoporotic fracture: a systematic review of the literature. Calcif Tissue Int 2008
6. Hannan EL, Magaziner J, Wang JJ, Eastwood EA, Silberzweig SB, Gilbert M, Morrison RS, McLaughlin MA, Orosz GM, Siu AL (2001).

"Mortality and locomotion 6 months after hospitalization for hip fracture: risk factors and risk-adjusted hospital outcomes". JAMA. 285 (21): 2736–42.

7. Cooper C, Campion G, Melton LJ 3rd. Hip fractures in the elderly: a world-wide projection. Osteoporos Int 1992; 2: 285-9.

8. Melton LJ 3rd, Chrischilles EA, Cooper C, Lane AW, Riggs BL. Perspective: how many women have osteoporosis? J Bone Miner Res 1992; 7: 1005-10.

9. Sadat-Ali M, Al-Dakheel DA, Azam MQ. Reassessment of osteoporosis-related femoral fractures and economic burden in Saudi Arabia. Arch Osteoporos 2015; 10: 37–37. doi: 10.1007/s11657-015-0240-5. Epub 2015 Oct 22.

10. Ramo J, Farre A. Burden of First Osteoporotic Hip Fracture in Spain: A Prospective, 12-Month , Observational Study. 2017;29–39.

11. Cummings KSÆSR. Incidence and risk factors for a second hip fracture in elderly women. The Study of Osteoporotic Fractures. 2003;130–6.

12. Mir Sadat-Ali, Moaad Alfaraidy, Abdulaziz AlHawas, Ahmed Abdallah Al-Othman, Dakheel A Al-Dakheel, Badar K Tayara. Morbidity and mortality after fragility hip fracture in a Saudi Arabian population: Report from a single center. Journal of International Medical Research 2017; 54(3): http://journals.sagepub.com/doi/full/10.1177/030 0060517706283 (accessed).

13. Frost M, Abrahamsen B, Masud T, Brixen K. Risk factors for fracture in elderly men: a population-based prospective study. 2012;521–31.

14. Alwahhabi BK. Osteoporosis in Saudi Arabia. Are we doing enough? Saudi Med J. 2015 Oct; 36(10): 1149–1150.

15. Saleh, SA, Musaad MA. Prevalence of Factors That Can Increase the Risk of Hip Fracture and Its Complications after Surgery. Egyptian Journal of Hospital Medicine. 2018; 70(1):215-222.

16. Chitragar DD, Shaikh SI. Association of Vertebral Fractures and Hip Fractures in Patients with Osteoporosis. National Journal of Medical Research. 2014;4(4).

17. Oommen A, AlZahrani I. Prevalence of osteoporosis and factors associated with osteoporosis in women above 40 years in the Northern Part of Saudi Arabia. Int J Res Med Sci. 2014 Feb;2(1):274-278.

18. El-Heis MA, Al-Kamil EA, Kheirallah KA, Al-Shatnawi TN, Gharaibia M, Al-Mnayyis A. Factors associated with osteoporosis among a sample of Jordanian women referred for investigation for osteoporosis. East Mediterr Health J. 2013;19(5):459-64.

19. Shin WC, Woo SH, Lee SJ, Lee JS, Kim C, Suh KT. Preoperative Prevalence of and Risk Factors for Venous Thromboembolism in Patients with a Hip Fracture: An Indirect Multidetector CT Venography Study. J Bone Joint Surg Am. 2016;98(24):2089-2095.

20. Wiklund R, Toots A, Conradsson M, Olofsson B, Holmberg H, Rosendahl E, Gustafson Y, Littbrand H. Risk factors for hip fracture in very old people: a population-based study. Osteoporos Int. 2016;27(3):923-931.

21. Caeiro JR, Bartra A, Mesa-Ramos M3, Etxebarría Í, Montejo J, Carpintero P, Sorio F, Gatell S, Farré A, Canals L; PROA investigators. Burden of First Osteoporotic Hip Fracture in Spain: A Prospective, 12-Month, Observational Study. Calcif Tissue Int. 2017 Jan; 100(1):29-39.