PREVALENCE OF OSTEOPOROTIC VERTEBRAL FRACTURES IN OLDER ADULTS FEMALES WITH TYPE 2 DIABETES MELLITUS

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ABSTRACT :

Background: *Diabetes mellitus (DM) is a metabolic disease with an increasing prevalence worldwide. In Egypt, it affects a large sector of the population with a great financial and health burden. It was estimated that the number of diabetic patients in Egypt was 8.9 million people in 2020. DM affects nearly all body systems. Bone health is markedly affected by diabetes, and diabetes mellitus is associated with an increased fracture risk compared to non-diabetics individuals. Osteoporotic vertebral fractures are one of the most common osteoporotic fractures that are asymptomatic and may associate with diabetes.*

Aim of the work: *This study aimed to investigate the prevalence of osteoporotic vertebral fractures among older adults type 2 diabetic females.*

Patients and Methods: *A cross-sectional study was conducted on 100 older adults type 2 diabetic females aged ≥ 60 years, who were recruited from the inpatient wards and outpatient geriatric clinics of Mansoura University Hospitals. All participants were subjected to comprehensive geriatric assessments, BMI calculation (kg/m2), and assessment of 10 years probability of fractures risk using the WHO fracture risk assessment tool (FRAX). The Palestinian version of FRAX was used as the Egyptian version is not available yet. Plain x-ray on the dorsal and lumbar spines, both lateral and antero-posterior view, were done for assessment of vertebral fractures. Approval by the ethical committee of the Faculty of Medicine, Ain Shams University, has been taken.*

Results: *The prevalence of osteoporotic vertebral fractures among older adults type 2 diabetic females was found to be 28%, Most of the fracture cases were asymptomatic. There was a significant association between vertebral osteoporotic fractures and history of cerebrovascular stroke, slower timed up and go test (TUG) times, a decline in instrumental activities of daily living (IADL), and increased fracture risk for major osteoporotic fractures in 10 years according to FRAX-Palestine.*

Conclusion: *Prevalence of osteoporotic vertebral fractures among older adults type 2 diabetic females was found as high as 28%. There was a significant association between vertebral fractures and history of cerebrovascular stroke, slower TUG times, and functional decline in IADL, and increased fracture risk for major osteoporotic fractures in 10 years according to FRAX-Palestine.*

Keywords: *older adults, type 2 diabetes mellitus, female, osteoporosis, vertebral fractures.*

INTRODUCTION:

Diabetes mellitus is a metabolic disorder with great health and social impact.Type 2 DM accounts for 90% of all diabetic patients in the population,so DM prevalence numbers are largely determined by people with type2 DM[(1)]. It was estimated that about 462 million

people had type2 diabetes universally in 2017 equal to a percentage of 6.28% of the whole world population or a prevalence rate of 6059 cases per 100,000. 4.4% of those aged between 15-49 years, 15% of those between 50 and 69 years, and 22% of those who aged 70 years and older[(2)]**.**

In Egypt, DM is a rapidly growing health problem. It has a great impact on morbidity and mortality in addition to the financial burden on health care resources. Currently, the prevalence of type 2 DM is around 15.6% of all adults aged 20 to 79 years old[(3)].

Diabetes mellitus is one of the top ten causes of death worldwide. Diabetes, together with cancer, cardiovascular disease, and respiratory diseases, all account for 80% of all early non-communicable diseases deaths[(4)]. Diabetes is associated with many complications and negative health-related outcomes. Diabetic osteopathy is one of these complications, which increases the risk of fractures, leading to a high level of disability and mortality[(5)].

In type1 DM, and as a result of a defect in insulin secretion, bone formation slows down while bone resorption becomes relatively faster, leading to a decrease in bone mineral density (BMD), impaired bone mineralization, and impaired bone microarchitecture[(6)]. In type2 DM, the exact mechanism of bone disease is still unclear[(7)], however, several studies have found complex mechanisms that range from the cellular level with molecular alterations in cell signaling that alter the bone turnover and result in changes in the microarchitecture and microvascular quality of bone[(8)].

Osteoporotic fractures are one of the commonest types of fractures with great financial and health burdens. Besides that, they are considered a risk factor for the occurrence of subsequent fragility fractures. [(9)] It is estimated that one in every three women and one in every five men older than 50 years will experience an osteoporotic fracture in their life. [(10)] Additionally, it is estimated that there are 9 million worldwide osteoporotic fractures annually by a rate of one fracture every three seconds which amounts to almost 25000 fractures per day, and 70% of these cases are women [(11,12&(13)]. In Europe, fragility fractures come in the 4th rank of the most common chronic comorbid disease after ischemic heart disease, dementia, and lung diseases. Besides this marked health burden, osteoporotic fractures cost about 37 billion EUR annually[(13&14)]

In the United States and the European Union, osteoporosis and fragility fractures are considered a major health problem and financial burden. It spends between 10 to 17 billion USD annually [(15)], with the expectation to rise to 25.3 billion USD in 2025 in the USA [(16)] and rise to 30.9 billion USD annually in the European Union in 2025[(17)].

The hip, vertebrae, and forearm are the classic sites for osteoporotic or fragility fractures[(18)]. Regarding vertebral fracture risk, it is increased in individuals with type2 DM. Furthermore, vertebral fractures in individuals with type 2DM seem to be associated with an increased risk of non-vertebral fracture and higher mortality compared to non-diabetics. Therefore, older adults with type2 DM could benefit from systematic screening during their medical assessment, in outpatient clinics, for the presence of osteoporotic vertebral fractures.[(19)]

THE AIM OF THE STUDY:

The aim of the study is to investigate the prevalence of osteoporotic vertebral fractures among older adults type 2 diabetic females.

SUBJECTS AND METHODS:

Study design and settings:

A cross-sectional study was conducted on 100 type 2 diabetic women aged ≥ 60

years. Participants were recruited from the inpatient wards and outpatient geriatric clinics of Mansoura university hospitals, during the period from February 2020 to February 2021.

Sample Size:

A total sample size of 100 type 2 diabetic women, aged 60 years and above were recruited, by the convenience sampling method.

Inclusion Criteria:

Older adults women, 60 years old and above, with type 2 diabetes mellitus.

Exclusion criteria:

We excluded patients who did not give consent to participate in the study, patients with type 1DM, patients with any medical condition that is known to cause secondary osteoporosis, such as systemic lupus, rheumatoid arthritis, malignancy, chronic kidney disease or renal failure, liver cell failure, malabsorption syndromes such as celiac disease, multiple sclerosis, hyperthyroidism, and hyperparathyroidism. Patients who were taking medications known to cause secondary osteoporosis (for ≥3 months)[20] were excluded. Patients who were receiving medical treatment for osteoporosis were excluded also. Finally, those who had previous osteoporotic fragility fractures (by medical history) were excluded while patients with previous history of traumatic fractures at a younger age were not.

Methods :

All participants were subjected to comprehensive geriatric assessment including, medical history taking using a structured interview questionnaire to collect relevant data about (a) Socio-demographics, (b) Smoking and alcohol intake, (c) Diabetes mellitus data such as duration, treatment, compliance on treatment, diabetic complications (as neuropathy, retinopathy, nephropathy), (d) Comorbidities including hypertension, renal problems, hepatic problems, cerebrovascular disease mainly stroke, cardiovascular disease (mainly IHD), peripheral arterial disease, thyroid disorder, and respiratory problems as (bronchial asthma or COPD) and past history of fractures. (e) Medications history including medications known to cause secondary osteoporosis (for exclusion) such as glucocorticoid (for ≥3 months), proton pump inhibitors, selective serotonin-reuptake inhibitors, anticonvulsants, thiazolidinedi-ones, Medroxy-progesterone acetate, aromatase- inhibitors, heparin, calcineurin inhibitors, lithium, methotrexate, thyroxin, antacids containing aluminum. (f) Data regarding previous osteoporosis diagnosis or treatment were obtained.

Clinical examination with special emphasis on lower limb examination for neuropathy and peripheral pulsations. Examination of the back, for kyphosis and tenderness. Body mass index calculation; as BMI = Weight \ (Height)^2 [21] with weight in kilograms and height in meters. Geriatric assessment tools including assessment of the risk of falls by the timed up and go (TUG) test[22], nutritional assessment by the Mini Nutritional Assessment (MNA) Arabic version[23], screening for depression by Patient Health Questionnaire-2 (PHQ2)[24], functional assessment by using Activities of daily living (ADL)[25] and Instrumental Activities of daily living (IADL) [26], and assessment of 10 years probability of fracture risk by (FRAX-Palestine). [27] We used the Palestinian version of FRAX as the Egyptian version of FRAX is not established yet, as the Palestinian people are closer to Egyptians in their characteristics. . FRAX score was measured by evaluation of its 12 items except for femoral neck BMD, the 12 items are (age, sex, weight, height, previous fractures, parental hip fractures, current smoking, glucocorticoids intake, rheumatoid arthritis, secondary osteoporosis, and alcohol intake).

Radiological assessment:

Radiological evaluation was done by plain x-ray lateral and anteroposterior view

on the dorsal and lumbar spine using Korean plain x-ray apparatus listem REX 525R, manufactured by listem corp in 2010, at radiology unit, Mansoura university hospital. X- Rays were interpreted by 2 radiologists for diagnosing vertebral fractures if present.

Ethical Considerations:

- The study has been performed according to Helsinki declaration in 1964[28].
- Approval by the ethical committee of the Faculty of Medicine, Ain Shams University, has been taken.
- Informed consent has been obtained from each participant or the patients' caregivers in the case of patients with dementia.
- Participation in this study was on a voluntary basis.
- Confidentiality and privacy of data were ensured, and participants were notified by their radiology data results extracted from this study.

Statistical methods:

The collected data were coded, tabulated, and statistically analyzed using IBM SPSS (Statistical Package for Social Sciences) software version 22.0, IBM Corp., Chicago, USA, 2013.

Quantitative normally distributed data were described as mean±SD (standard deviation) after testing for normality using the Shapiro-Wilk test, then compared using independent t-test if normally distributed. Qualitative data were described as numbers and percentages and were compared using the Chi-square test and Fisher's exact test for variables with small, expected numbers The level of significance was taken at $P < 0.05$ was significant, $P < 0.01$ is highly significant, and $P > 0.05$ is not significant.

RESULTS:

Table (1) shows that vertebral fractures were found in 28% of cases. More than two-thirds (73%) of cases had decreased low bone mineral density on their x.ray examination. Regarding cases with vertebral fractures, T10, T11, and T12 were the most frequently affected vertebrae, more than half of the affected cases (57.14%) had two or more fractured vertebrae, and most of the cases were asymptomatic as nearly one-fifth (21.4%) of affected cases had symptoms.

Table (1): Radiological findings of the study participants

Radiological & Clinical findings			Cases (total n= 100)	
			Number	%
Participants with Osteoporotic vertebral fractures			28	28%
Vertebral X-ray findings		Cases with low bone density in X-ray examination	73	73%
		Cases with low BMD without fracture(s)	45	61.64%
		Cases with low BMD and fracture(s)	28	38.35%
Level of vertebral fracture		T7	1	3.57%
		T8	3	10.71%
		T9	5	17.85%
		T10	6	21.42%
		T11	8	28.57%
		T12	10	35.71%
		L1	5	17.85%
		L2	5	17.85%
		L3	3	10.71%
		L4	5	17.85%
		L5	3	10.71%
Number of vertebral fracture(s)/participant (total= 28)	Single fracture (42.85%)	One fracture	12	42.85%
	Multiple fractures (57.14 %)	Two fractures	9	32.14%
		Three fractures	5	17.85%
		Four fractures	2	7.14%
Clinical Presentation		Symptomatic	6	21.4%
		Asymptomatic	22	78.6%

Table (2) Comparison between fractured & non-fractured participants regarding demographic characteristics and comorbidities

Participants Variables		Participants with Fractures (N=28)	Participants without fractures (N=72)	P-value
Age (years)		68.1±5.4	66.4±5.4	^0.167
Age groups (years)	60– 70	12 (42.9%)	21 (29.2%)	#0.191
	>70	16 (57.1%)	51 (70.8%)	
BMI (kg/m^2)		28.7±3.9	29.6±4.3	^0.298
BMI grade	Normal (18.5- 24.9)	6 (21.4%)	11 (15.3%)	§0.900
	Overweight (25.0 – 29.9)	10 (35.7%)	27 (37.5%)	
	Obesity class 1 (30.0 – 35.0)	9 (32.1%)	25 (34.7%)	
	obesity class 2&3 (≥35.0)	3 (10.7%)	9 (12.5%)	
Comorbidities	Cerebrovascular stroke	7 (25.0%)	4 (5.6%)	§0.010*
	IHD	13 (46.4%)	20 (27.8%)	#0.075
	Hypertension	20 (71.4%)	46 (63.9%)	#0.475
	PAD	4 (14.3%)	4 (5.6%)	§0.215
	COPD/Asthma	0 (0.0%)	2 (2.8%)	§0.999
Parental history of fracture		7 (25.0%)	8 (11.1%)	§0.117
Past history of traumatic fractures		12 (42.9%)	21 (29.2%)	#0.191
Duration of DM (years)		17.1±6.0	14.7±8.0	^0.150
Treatment	Combined (insulin &oral)	14 (50.0%)	24 (33.3%)	#0.240
	Insulin	6 (21.4%)	26 (36.1%)	
	Oral hypoglycemics	8 (28.6%)	22 (30.6%)	

BMI: Body mass index. PAD: peripheral arterial disease, IHD ischemic heart disease, COPD chronic obstructive pulmonary disease**.** ^Independent t-test. #Chi square test. §Fisher's Exact test

Table (2) shows no significant differences between participants who have vertebral fractures and those who have not except for a history of cerebrovascular stroke that was more frequent in cases with vertebral fractures (P=0.01).

Table (3): Comparison between fractured & non-fractured participants regarding clinical characteristics & FRAX-Palestine score

Participants Variables		Participants with fractures (N=28)	Participants without fractures (N=72)	P-value
TUG time (seconds)		17.1±6.4	14.4±5.5	^0.036*
Assisted/Dependent in ADL		3 (10.7%)	9 (12.5%)	§0.999
Assisted/Dependent in IADL		26 (92.9%)	51 (70.8%)	§0.019*
At risk of depression by PHQ2		9 (32.1%)	19 (26.4%)	#0.565
Nutritional status by MNA	Normal	11 (39.3%)	23 (31.9%)	§0.537
	At risk	17 (60.7%)	45 (62.5%)	
	Undernourished	0 (0.0%)	4 (5.6%)	
10 years FRAX score for hip fracture (%) Mean +/- SD		2.5±1.9	1.9±1.8	^0.128
10 years FRAX score for major osteoporotic fracture (%) Mean +/- SD		8.5±3.1	6.5±3.6	^0.012*

TUG: timed up and go test, ADL: Activities of daily living, IADL: Instrumental activities of daily living, PHQ2: Patient Health Questionnaire-2, MNA: Mini Nutritional Assessment. ^Independent t-test. #Chi square test. §Fisher's Exact test

Table (3) shows that participants with vertebral fractures had a significantly higher risk of falls as indicated by slower TUG, had lower functional status according to their IADL, and had significantly higher FRAX score for major osteoporotic fracture as compared to participants without vertebral fractures

Table (4): Diagnostic performance of TUG test and 10 years FRAX score for major osteoporotic fracture in diagnosing vertebral fractures

Factors	AUC	SE	P-value	95% CI	Cut off
TUG-time (seconds)	0.663	0.059	0.011*	0.548−0.779	≥14.0
FRAX score for major osteoporotic fracture in 10 years (%)	0.696	0.055	0.002*	0.588−0.804	≥4.9

AUC: Area under the curve, SE: Standard error, CI: Confidence interval, *significant

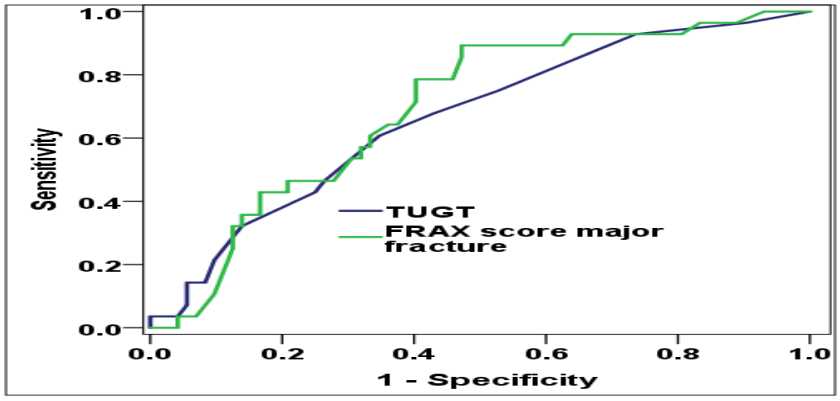

Diagram (1): ROC curve for TUGT and 10 years FRAX score for major fracture in diagnosing vertebral fractures

Table (4) and figure (1) show that the TUG test and 10 years FRAX score for major osteoporotic fracture had low diagnostic performance in diagnosing vertebral fractures.

DISCUSSION:

Diabetes mellitus and osteoporosis, both are major public health problems that affect a large proportion of older people around the world. One of the most common complications caused by osteoporosis is vertebral fractures, occurring in about 20% of all postmenopausal women leading to more disability and functional impairment[29]. In this cross-sectional study that was conducted on 100 older adults women with type 2 DM, we investigated the prevalence of osteoporotic vertebral fractures among them. The age range of the recruited participants was 60-83 years, with a mean age of 66.9 ±5.4 years. We found that 28% of total participants had vertebral fractures, and most of these vertebral fractures were in the lower dorsal spine and lumbar ones. Osteoporotic vertebral fractures are considered pathological fractures, and osteoporosis, if not appropriately treated, can lead to multiple vertebral fractures[30]. More than half of our cases with osteoporotic vertebral fractures (OVFs) had multiple not solitary fractures. Being reported by many studies that the majority of vertebral fractures are asymptomatic and diagnosed incidentally by radiography[31,32,33&34] we found that 78.30% of fractured cases in our study were asymptomatic.

The prevalence OVFs that occur with type 2 DM varies from a study to the other. some had results similar to our study such as *Viégas et al, (2011)*[35]. Their study included 148 postmenopausal diabetic women and showed a 23% prevalence of osteoporotic vertebral fractures. 65% of these fractures were located at the thoracic spine. Also, in a Japanese study done by *Yamamoto et al,(2008)*[36] and included 76 postmenopausal women with type 2DM, a prevalence of 26.3% was found. Similarly, *Muñoz-Torres et al,* (*2013)*[37] in their cross-sectional study in Granada, Spain that included 123 patients of both sexes with type 2DM and a mean age of 55 ±7 years found a prevalence of 27.8% of vertebral fractures.

On the other hand, some studies found relatively different results such as *Yamamoto et al,(2007)* [38] in their study which was conducted on 716 controls and 150 Japanese women with type 2DM, aged between 35 and 89 years with a mean age of 63.6 years, they reported a prevalence of 17.3% of vertebral fractures in diabetics compared to 22.1% in controls. This lower prevalence in this Japanese study could be attributed to their inclusion of younger women, while ours involved only those 60 years and above, also the different lifestyle and physical activity patterns between Japanese women compared to Egyptian women. Another important factor is hypovitaminosis D which is highly prevalent in the Middle Eastern and African region[39&40] and could be a contributing factor to osteoporosis besides DM and hence a higher percentage of osteoporotic fractures.

However, *Chung DJ et al,* (*2013)*[41] in their cross-sectional study on 2239 postmenopausal Korean women ≥50 years old from 24 tertiary hospital diabetes clinics found a higher prevalence of vertebral fractures (43.30%) among the studied group. This difference may be attributed to their large sample size and inclusion of patients with osteoporosis and on medication in their study.

Bone fragility has been recognized as a complication of diabetes, however, the mechanisms underlying bone fragility in diabetes are complex and have not been fully elucidated. Patients with type1 DM generally exhibit low bone mineral density (BMD), although the relatively small reduction in BMD does not entirely explain the increase in fracture risk. On the contrary, although

patients with type2 DM or prediabetes have normal or even higher BMD as compared with healthy subjects [42] they still have a 1.2- to 3-fold higher risk of fracture as compared with non-diabetic subjects[43]. Our study showed that the occurrence of osteoporotic vertebral fractures in type 2 DM patients was associated with decreased bone mineral density, and although this comes in contrast to Yamamoto et al, (2007) [38] who found a significant higher BMD in lumbar spines in women with type2 DM. This difference could be attributed to age difference as in their study it was (38–89), in addition, they used a different and accurate method dual-energy x-ray absorptiometry (DXA scan) for assessing BMD compared to our work where x-ray examination was used and its accuracy far beyond DXA scan.

Patients who had a previous fracture are liable for a new one more than others; as a history of fracture per se is considered a risk factor for new subsequent fracture,[44] especially in the first 2 years after the first fracture[45&46] *Yokomoto-Umakoshi et al, (2017)*[47] found such a significant association. In contrast, our study did not found such association and this finding agreed with *Viégas et al,(2011)*[35], who also showed no significant association between the history of the previous fracture and occurrence of OVF. This could be attributed to our exclusion of suspected previous osteoporotic or fragility fractures, and most of the previous fractures in our participants are related to trauma at a younger age.

Regarding fracture risk in type2 DM, it was found to increase by age [48], longer duration of diabetes >10 years [49], body mass index (BMI) < 30 kg/m^2 [50], and depression. [51] However, our study did not find such association.

Regarding stroke, it is a known risk factor for fractures. Neurological deficits and osteoporosis are associated with fractures that occur in stroke patients. [52] In one study, osteoporotic vertebral fracture was found as a risk factor for cerebrovascular stroke, so stroke could be considered as both a cause and effect of vertebral fractures. [53] Cerebrovascular stroke causes the patients to have low BMD, and low BMD increases the risk of stroke. [54] [55] Patients who had stroke tend to fall easily in the chronic stage due to the neurological deficits and poor dynamic balance, and they have a 2-4 times higher incidence of fractures than healthy persons, in addition, they have decreased bone density and a high risk for osteoporotic vertebral fractures. Therefore, detection and proper treatment of osteoporosis in chronic stroke patients are needed because it improves patients' functional prognosis to perform rehabilitation, which decreases the risk of future falls and fractures[56].

Our results showed a highly significant association between past history of cerebrovascular strokes and osteoporotic vertebral fractures. This comes in agreement with *Kim et al,(2008)* [57] in their study that included 48 patients, 55 years and above who had a stroke, BMD and plain radiography were done, and results showed a high prevalence of pre-stroke low BMD and vertebral fracture in patients experiencing the first stroke.

Falls are known to increase fractures risk, and one of the most valid tests for assessing falls risk is the timed up and go (TUG) test. The TUG test is a commonly used tool for assessing fall risk and functional mobility among older adults, by a simple way and limited equipment, and it is an integral measure of gait speed and balance in widespread clinical settings. [58] TUG test is considered as an indicator of physical performance and can provide information about future fracture risk above that provided by BMD[59]. Beyond mobility assessment, *Mousa SM et al,(2016)* [60]found that slower TUG test (more than 20 seconds) is associated directly with lower BMD and osteoporosis. We found a significant association between the slower TUG test and

the presence of vertebral osteoporotic fractures. This was similar to the data shown by others as *Jeong SM et al, (2019)*[59] and *Daldoul C et al,(2019)* [61].

Regarding the TUG test, we found the cutoff point at which the occurrence of vertebral fracture was recorded is ≥14 seconds. The exact cutoff point that relates to fractures was investigated in other studies but came with different values. For example, *Jeong SM et al, (2019)* [59] found an increased risk of vertebral fractures at TUG cutoff ≥ 10 seconds, while *Larsson et al,* (*2021)* [62] found the cutoff ≥12 seconds. These differences in TUG test cutoff values for increasing risk of vertebral fractures might be related to the higher prevalence of diabetic complications in our patients specifically peripheral neuropathy that was found in 86% of our patients which can cause slower walking speed in TUG test,[63] besides that they were studying the incidence not the prevalence as ours.

On the other hand, *Guo Y et al, (2020)*[64] in their study that was conducted on 201 elderly, both men and women, diabetics and non-diabetics, with an average age of 70.05 ± 6.54 who had a history of fragility fractures found that slow TUG time was an independent risk factor for fractures in non-type 2 DM patients, while no associations were found in the type2DM population. The range of ages of the chosen group could explain the different results.

Regarding functional performance and prevalence of OVF, we found a significant association between lower functional level, as being assisted or dependent in IADL, and occurrence of OVF. Diabetes mellitus is known to lead to functional impairment and disability,[65] these functional impairment and physical inactivity are important risk factors for osteoporosis and hence osteoporotic fractures[66].

Hip fractures and those of the vertebrae with clinical manifestations are especially important since they carry an increase in mortality[67]. There is a wide consensus regarding the need to develop strategies for the prevention of fractures and it has been recommended that the decision and the threshold of intervention be based on clinical assessment of the risk of fragility fracture and not only on the values of BMD [68&69] In our study, the higher FRAX score for 10 years of major osteoporotic fractures was associated with osteoporotic vertebral fractures with a sensitivity of 89.3% and specificity of 50.0%, yet it has no diagnostic value for vertebral fractures with AUC 0.69.

Giangregorio et al, (*2012)*[70] in their study which was conducted on 3518 diabetics and 36,085 non-diabetics of both sexes aged ≥50 years at the time of BMD testing (1990 to 2007) who were identified in a large clinical database from Manitoba, Canada. FRAX probabilities were calculated, and fracture outcomes to 2008 were established via linkage with a population-based data repository found that FRAX score using BMD underestimated observed major osteoporotic and hip fracture risk in diabetics. while, *Leslie et al,* (*2014)* [71] found no significant association between FRAX score and fracture detection in diabetic patients.

Conclusion:

The prevalence of osteoporotic vertebral fractures in older adults women with type 2DM in the current study was 28%, all cases with fractures had low bone density in their x-ray examination, the majority of these fractures were in the lower dorsal spine, most of the cases with fractures had two or more vertebrae affected, and most of these cases were asymptomatic. History of cerebrovascular stroke was frequent in cases with vertebral fractures, while both duration & type of DM treatment show no association with fractures. Patients with vertebral fractures had a higher risk of falls, a lower functional level in IADL, and a higher FRAX score for major osteoporotic fractures. TUG-Test time and FRAX score for major

osteoporotic fracture had low diagnostic performance in diagnosing vertebral fractures.

Conflicts of interest:

There was no conflict of interest.

Limitations

Finally, this study has some limitations. First, we recruited participants only from either inpatient wards or outpatient clinics in Mansoura University Hospitals, so the participants enrolled in this study might not be representative of all Egyptian female patients with type2 DM, so a much larger community-based study is needed. In addition to the assumption that they may have more severe diseases than older adults women in the community. Second, we examined BMD in X-ray in association with fractures and not by DXA scan.

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دراسة معدل انتشار كسور وهن العظام الفقارية في السيدات المسنات المصابات بمرض السكرى من النوع الثاني

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الخلفية : يُعَد داء السكري من الأمراض الأيضية التي تشهد انتشارا متزايدا في مختلف أنحاء العالم. وفي مصر ، يصيب قطاع كبير من السكان بما له من اعباء صحية ومالية كبيرة . وتشير التقديرات الي ان عدد المصابين بداء السكري في مصر عام 2020 قد وصل الي 8.9 مليون شخص . كما يؤثر داء السكري علي معظم اجهزة الجسم تقريبا فانه يؤثر بشكل ملحوظ علي العظام . ويرتبط مرض السكري بزيادة مخاطر الاصابة بكسور العظام مقارنة بغيرهم من اللذين لا يعانون من مرض السكري . وتعد كسور وهن العظام الفقارية احدى اكثر كسور وهن العظام شيوعا والتي في الاغلب تحدث بدون اعراض في مرضي السكري .

الهدف من الدراسة تهدف هذه الدراسة إلى دراسة مدى انتشار كسور وهن العظام الفقارية بين السيدات المسنات المصابات بالسكري من النوع الثانى.

المرضى وطرق البحث أجريت دراسة مقطعيه عرضية على 100 أنثى مصابة بالسكري من النوع الثاني من المسنات واللائي تتراوح أعمارهن ≤ 60 عاما ، تم اختيارهن من أقسام المرضى الداخليه وعيادات المسنين الخارجية التابعة لمستشفيات جامعة المنصورة. وخضع جميع المشاركين لتقييم شامل للشيخوخة ، وحساب مؤشر كتلة الجسم (كيلوغرام/م2) ، وتقييم احتمالات حدوث الكسور لمدة 10 عاماً باستخدام أداة تقييم مخاطر الكسور التابعة لمنظة الصحة العالمية النسخة الفلسطينية وذلك لان النسخة المصرية غير متوفرة (FRAX SCORE)

وقد أجريت الأشعة السينية على فقرات الظهرالقطنية والصدريه ، من الناحية الجانبية الامامية -الخلفية ، لتقييم الكسور الفقارية. وقد تم الحصول علي موافقة لجنة اخلاقيات البحث العلمي التابعة لجامعة عين شمس قبل البدأ في الدراسة .

النتائج : وقد خلصت نتائج الدراسة الي ان معدل انتشار كسور وهن العظام الفقارية في السيدات المسنات المصابات بمرض السكري من النوع الثاني الي 28% من العينة المختارة للدراسه. كما تبين ان الغالبيه العظمى من هذه الكسور صامته بدون اعراض . كما وجد انه يوجد ارتباط بين كسور وهن العظام الفقارية وكل من التاريخ المرضي للسكتات الدماغية الوعائية وكل بطئ التقييم الحركي للمرضي والاعتمادية او المساعده في اختبار الانشطه الحياتية اليومية و اداة ال عشر سنوات تقيم خطر الكسور المحتمله للكسور العظمية الكبري .

الخاتمة : معدل انتشار كسور وهن العظام الفقارية في السيدات المسنات المصابات بمرض السكري من النوع الثاني 28%. كما وجد انه يوجد ارتباط بين كسور وهن العظام الفقارية وكل من التاريخ المرضي للسكتات الدماغية الوعائية وكل من بطئ التقييم الحركي للمرضي والاعتمادية او المساعده في اختبار الانشطه الحياتية اليومية و اداة ال عشر سنوات تقيم خطر الكسور المحتمله للكسور العظمية الكبري