

Original Research Article

Prevalence of Waja‘al-Mafāṣil in the patients of Dhayābīṭus, attending NIUM hospital: a cross-sectional study

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ABSTRACT

Background: Osteoarthritis (OA) is the most common form of arthritis typically affecting the various joints with a prevalence of 22-39% in India. Diabetes is a major health issue that has reached alarming levels. Diabetes and osteoarthritis share common risk factors and due to this factor, this study was carried out to know the prevalence of osteoarthritis among diabetic patients, visiting the hospital of NIUM, Bengaluru.

Methods: It is a hospital-based cross-sectional study, which was carried out with a sample size of 250 patients of both genders, selected through purposive sampling. The duration of the study was one year (March 2022 to February 2023). A predesigned and semi-structured schedule included information related to demography, socioeconomic status, anthropometry, personal habits, etc. were obtained.

Results: Among enrolled (250) diabetic patients, the overall prevalence of osteoarthritis was 54.4% (136) which was statistically significant ($p > 0.001$). Among 136 diabetic patients with osteoarthritis, the highest prevalence (46.32%) in the age group 50-60 years, the lowest prevalence (8.1%) was seen in the age group 30-40 years. The *Balghamī* type was observed in 85% of patients while in 15% it was observed as *Murakkab* type.

Conclusions: The present study showed that the prevalence of OA was found to be 54.4% among diabetic patients, in which *Balghamī* type *Waja‘al-Mafāṣil* was of maximum (85%), which may be interpreted that the main cause of *Waja‘al-Mafāṣil* was the *Balghamī Mizāj* of the patients, that is mentioned in classical Unani literatures, it means that the observations of Unani physicians were very keen and perfect.

Keywords: Cross-sectional, Diabetes mellitus, Frozen shoulder, Knee joint, Osteoarthritis, Prevalence

INTRODUCTION

Osteoarthritis (OA) is a condition marked by advancing joint degeneration in which all joint components have undergone pathologic alteration. The pathology of osteoarthritis is the loss of hyaline articular cartilage accompanied by an increase in thickness and density is the pathologic prerequisite of OA. The articular capsule stretching, sclerosis of the subchondral bone plate, formation of osteophytes at the joint edge, and weakening of the muscles bridging the joint. Although there are many other paths that might result in OA, joint damage

that occurs when protective mechanisms fail is frequently the first step.¹

Cause is multifactorial, commonly its thought to be wear and tear of joints as one ages. the knee joint is most commonly involved it starts in one knee but over a period of time another knee is also involved, OA is the most common form of arthritis typically affecting the hands, hips, knees, spine and feet. OA is divided into primary and secondary forms. Primary OA is more common than secondary OA. Altered cartilage physiology is common in both forms.²

The cause of primary knee OA is unknown, Secondary OA has an identifiable cause. American College of Rheumatology classification criteria is used to diagnose this disease.³ Symptoms include pain, it will be dull in nature and often occurs after rest, a coarse crepitus may be present, swelling of the joint is usually a late feature and it occurs due to effusion caused by inflammation of the synovial tissues, stiffness is due to pain, other symptoms are feeling of instability of the joint and locking resulting from loose bodies and frayed menisci.⁴⁻⁵

According to the Unani System of Medicine *Waja'al-Mafāṣil* (Osteoarthritis) is a type of arthralgia which involves several joints, based on the aetiology, it is classified into different types. Unani Scholars such as Abū'l Ḥasan 'Alī ibn Sahl Rabban Ṭabarī [780-850 AD], Abū Bakr Muḥammad ibn Zakariyyā Rāzī [865-925 AD] 'Alī ibn 'Abbās al-Majūsī, [930-994 AD].⁶⁻⁹ Abū al-Manṣūr al-Ḥasan ibn Nūh al-Qamarī [930-990 AD].¹⁰ Abū Sahl 'Īsā bin Yaḥyā bin Ibrāhīm al-Masīhī [d. 1010 AD], and many scholars described about *Waja'al-Mafāṣil* in detail.¹¹ *Waja'al-Mafāṣil* is an Arabic word, *Waja'* means pain and *Mafāṣil* means joint so the meaning of *Waja'al-Mafāṣil* is pain in the joint. *Waja'al-Mafāṣil* is a broad topic in Unani System of Medicine where it includes all the joint disorders such as '*Irq al-Nasā* (sciatica), *Waja'al-Warik* (hip joint pain), *Niqris* (gout), *Waja'al-Qaṭan* (low backache), *Waja'al-Rukba* (knee joint pain) etc.¹²⁻¹³ Commonly *Waja'al-Mafāṣil* is caused by *Madda*. The basic pathology of the disease is the accumulation of morbid matter due to weakness of the joint, the weakness of a particular joint is either due to *Sū'-i-Mizāj* or secondary to injury etc.¹⁴ According to the type of *Waja'al-Mafāṣil*, clinical characteristics have been documented in the Unani System of Medicine. The location of the pain, colour, heaviness, discomfort, hotness, and coldness of the affected joint can be used to analyse the symptoms and indicators.¹⁵⁻¹⁷

Diabetes mellitus is a metabolic disorder of multiple aetiology characterized by chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action or both. There are two common types; type 1 also known as insulin dependent diabetes mellitus and type 2 also known as non-insulin dependent diabetes mellitus.¹⁸ The long-term effect of diabetes includes damage, dysfunction and failure of various organs, the long-term effects include the progressive development of retinopathy with potential blindness, nephropathy that may lead to renal failure, neuropathy with risk of foot ulcers, amputation, Charcot joints and features of autonomic dysfunction including sexual dysfunction. People with diabetes are at increased risk of peripheral vascular and cardiovascular diseases.⁴ In the Unani System of Medicine, *Dhayābītus* is considered a disease of *Kulya* and it occurs due to *Sū'-i-Mizāj-i-Kulya* (abnormal temperament of the kidney). This study was carried out to know the prevalence of *Waja'al-Mafāṣil* in the patients of *Dhayābītus Shakarī* visiting the hospital of the NIUM, and to assess the

association between *Waja'al-Mafāṣil* and *Dhayābītus Shakarī*, and to measure the disease burden among them and in the population of Bengaluru.

METHODS

A hospital-based, cross-sectional study was carried out in the OPDs of the hospital of the National Institute of Unani Medicine, Bengaluru with a sample size of 250 patients of diabetes mellitus. Inclusion criteria were the patients of diabetes mellitus between the age group of 30 to 65 years and the patients of either gender. Exclusion criteria were patients other than diabetes mellitus, patients who do not co-operate/not willing and patient below the age of 30 years and above 65 years. The study was done from March 2022 to February 2023. Before starting the study, a complete study protocol was prepared and applied for clearance from the Institutional Ethics Committee (IEC) of NIUM Bengaluru. After getting the ethical clearance and obtaining CTRI/2022/04/041849 by Clinical Trial Registry of India, the study was started.

The data were collected with a purposive sampling technique from the under-studied population through an interview. A detailed schedule was used keeping in view the objective of the study, which was divided into seven parts: the first part was based on a sociodemographic profile, which contains information regarding name, age, gender, marital status, religion, height, weight, body mass index (BMI), family type, habitat, education, occupation, family income, socio-economic status (Kuppuswamy Socioeconomic Scale 2022). The second part contained information regarding personal habits like smoking, use of tobacco, alcohol intake, and use of caffeinated beverages. The third part contained information regarding physical work, dietary habits, appetite, sleep, bladder and bowel habits. The fourth part contained information regarding the duration of diabetes, family history, medication of diabetes, treatment adherence, co-morbidities, frequency and duration of exercise. The fifth part contained information regarding the history of any recent injury to the joint, physical examination of the joint, presence of joint pain, duration of pain, pain aggravating and relieving factors, presence of swelling, presence of crepitation, any disability or deformity, history of using pain relievers or intra articular injections, radiography (X-ray) findings. The sixth part contained information regarding the final diagnosis, i.e. which joint is affected, whether patients have osteoarthritis of the joint or not, and if yes then either unilateral or bilateral, in case of knee osteoarthritis, the "Kellgren Lawrence Grading System of Knee OA" was used to know the grades (1-4). The seventh part contained information regarding symptoms of *Waja'al-Mafāṣil* according to *Mizāj*, i.e. *Sū'-i-Mizāj Sāda*, *Sū'-i-Mizāj Māddī* (*Damawī*, *Safrāwī*, *Balghamī*, *Sawdāwī*, *Rihī*, *Murakkab*) to see which *Khilt* (humour) is involved and dominant. Before the interview written informed consent was taken. For this purpose, the patient was explained that the study is undertaken for awareness among them, about the

necessary measures, which can be taken to prevent this ailment and its complications. After explanation, signatures of patients or their thumb impressions were taken.

RESULTS

The present study showed that the prevalence of osteoarthritis among diabetic patients was 54.4%.

Table 1: Distribution of diabetic patients according to the presence of osteoarthritis.

	N (%)
Diseased (osteoarthritis)	136
Non- diseased	114
Total	250
Prevalence of osteoarthritis	54.4%
95% confidence level	(48.01-60.69)

Chi-Square Test, Statistically Significant ($p > 0.001$)

Table 2: Distribution of diabetic patients according to the association of age vs osteoarthritis.

Age (in years)	Osteoarthritis, N (%)
30-40	11 (8.08)
40-50	38 (27.94)
50-60	63 (46.32)
60-65	24 (17.66)
Total	136 (100)

Chi-Square Test, $P < 0.001$, Statistically Significant

Table 3: Distribution of diabetic patients according to the association of gender vs osteoarthritis.

Gender	Osteoarthritis, N (%)
Females	97 (71.32)
Males	39 (28.68)
Total	136 (100)

Chi-Square Test, $P < 0.001$, Statistically Significant

Table 4: Distribution of diabetic patients according to the association of education vs osteoarthritis.

Education	Yes (%)
Graduate	5 (3.68)
High School	17 (12.50)
Illiterate	48 (35)
Intermediate	3 (2.20)
Middle School	48 (35)
Primary	15 (11.02)
Total	136 (100)

Chi-Square Test, $P = 0.398$

Prevalence increases with age 30-40, 40-50, 50-60, and 60-65 years was 8.08%, 27.94%, 46.32%, and 17.66% respectively which was statistically significant (Chi-Square test, $P = 0.001$). The prevalence of OA in females

was 97 (71.32%) when compared to males 39 (28.68%) which was statistically significant (Chi-Square test, $p < 0.001$). The prevalence of OA in patients of the lower class was 51.47% as compared to upper lower class 22.79%, lower middle class 22.05%, and upper middle class 2.96%. The data shows a higher prevalence of knee OA among the lower class. The highest prevalence of OA was found among unemployed 67 (49.26%), sales workers 24 (17.64%), followed by machine operators 10 (7.35%), technician 7 (5.14%), agriculture workers 4 (2.94%), elementary occupation 2 (1.47%), statistically significant (Chi-Square test, $p < 0.001$). This data shows the prevalence of OA in 115 (84.5%) normal BMI, in 15 (11.02%) obese, in 6 (4.41%) overweight patients. The highest prevalence of OA was seen in 103 (75%) in mild workers, 21 (15%) in hard workers, 10 (7.35%) in moderate workers, 2 (1.60%) in sedentary, statistically significant (Chi-Square test, $p < 0.001$). Highest co-morbidity with OA noted was 91 (82%) hypertension, 11 (8.09%) hypothyroidism, 6 (5.40%) dyslipidaemia, 3 (2.70%) ischemic heart disease, statistically significant (Chi-Square test, $P = 0.016$). Out of 250 diabetes patients, 114 had no symptoms of OA, while 136 patient have symptoms of OA, in which 15 (11.02) were affected by Right shoulder, 15 (11.02) by left shoulder, 99 (72.8%) by bilateral OA of the knee joint [grade-1 19 (19.2%), grade-2 70 (70.7%), grade-3 10 (10.1%)], 3 (2.20%) by calcaneal spur, 2 (1.47%) by unilateral OA of the knee joint, while 1 (0.74%) by degenerative changes in the ankle joint and 1 (0.74%) by fracture in the ankle joint, statistically significant (Chi-Square test, $P = 0.001$). Data shows prevalence of OA in 116 (85%) *Balghami* patients and in 20 (15%) *Murakkab* patients which is statistically significant (Chi-Square test, $P = 0.001$).

Table 5: Distribution of diabetic patients according to the association of SES vs osteoarthritis.

SES	Yes (%)
Lower class	70 (51.48)
Lower middle	30 (22.05)
Upper	1 (0.73)
Upper lower	31 (22.80)
Upper middle	4 (2.94)
Total	136 (100)

Chi-Square Test, $P = 0.621$

Table 6: Distribution of diabetic patients according to the association of co-morbidity vs osteoarthritis.

Co-morbidity	Osteoarthritis, N (%)
Dyslipidaemia	6 (5.40)
Hypertension	91 (81.98)
Hypothyroidism	11 (9.90)
IHD	3 (2.70)
Total	111 (100)

Chi-Square Test, $P = 0.016$, Statistically Significant

Table 7: Distribution of diabetic patients according to the association of type of Mizāj vs osteoarthritis.

Type of Mizāj	Osteoarthritis, N (%)
Balghamī	116 (85.29)
Murakkab	20 (14.71)
Total	136 (100)

Chi-Square Test, P=0.001, Statistically Significant

Table 8: Distribution of diabetic patients according to the association of joint affected vs osteoarthritis.

Joint affected	Frequency	Percent
Right shoulder	15	11.02
Left shoulder	15	11.02
Knee (bilateral)	99	72.80
Knee (unilateral)	2	1.48
Foot (calcaneal spur)	3	2.20
Ankle	2	1.48
Total	136	100

Chi-Square Test, P<0.001, Statistically Significant

Table 9: Distribution of diabetic patients according to the OA grades.

Grades	Osteoarthritis, N (%)
Grade 1	19 (19.2)
Grade 2	70 (70.7)
Grade 3	10 (10.1)
Total	99 (100)

Chi-Square Test, P=0.001, Statistically Significant

DISCUSSION

Out of 250 diabetic patients the prevalence of Waja'al-Mafāsil was found to be 136 (54.4%). These results correlate with the findings of Louati et al, Mariely Nieves-Plaza et al, Chowdhury et al.¹⁹⁻²¹ The maximum prevalence in the age group of 50-60 years was found to be 46.32%. The prevalence of OA increases with age, which is correlates with the claims made by Kasper et al, Kumar and Clark, Patil et al.²²⁻²⁴ In this study the prevalence of OA is less in age group above 60 years, which is due to less number of enrolment of this age group patients. The prevalence of OA in females was 97 (71.32%) when compared to males 39 (28.68%). The reason for higher incidence among females may be the presence of enrolment and also due to postmenopausal status which correlates with the findings of Kaspar et al, Warrel et al, Patil et al, Russel et al.^{22,24,25-27} The maximum prevalence of OA in patients of the lower class was found to be 51.47%, which correlates with the findings of Ajit et al.²⁸

In this study the higher prevalence of OA was found to be 48 (35%) in illiterate patients and same in middle school passed patient. This reveals the higher prevalence of knee OA among illiterate and lower-educated patients, which correlates with the findings of Ajit et al, Salve et al.^{28,29}

The highest prevalence of OA was found to be among unemployed 67 (49.26%) patients, which correlate with the statement of Kaspar et al.²² The data shows the highest prevalence of OA found to be 115 (84.50%) in patient with normal BMI, which is showing that the overweight or obesity is not a significant factor for OA while the studies of Piva et al, and Patil et al, revealed that the obesity is an important risk factor for OA.^{30,24} It contributes to the development of OA via biomechanical and systemic pathways. The data of said studies are not correlating with our study. The data shows a prevalence of OA found to be 37 (27.20%) in patients with disturbed sleep, while 99 (72.80%) patients having normal sleep. Chowdhury et al state that diabetes mellitus increases osteoarthritis pain.³¹ In this study, sleep disturbance was observed in 27% of the cases. The reason for disturbed sleep might be osteoarthritis pain. Highest co-morbidity noted was hypertension in 91 (82%) patients after that hypothyroidism were found in 11 (8.09%), while other co-morbidities were found to be very less. Piva et al states that hypertension and dyslipidaemia, both widely recognized risk factors for T2DM, have been proposed to contribute to the development of OA.³⁰ In this study, hypertension and hypothyroidism were observed as maximum co-morbidity. The majority of the patients were on oral anti-hyperglycaemic treatment 132 (97.06%), and 4 (2.94%) were not on any medication. The treatment adherence was good in 127 (93.38%), bad in 5 (3.68%), not on treatment 4 (2.94%). Piva et al states that several investigators have postulated that altered glucose metabolism could be a direct link between OA and T2DM.³⁰ In this study the type of Waja'al-Mafāsil also observed, it was found to be 116 (85.29%) Balghamī type and 20(14.71%) Murakkab type. Unani scholars like Rāzī, Ibn Sīnā, Ibn Hubal Baghdādī, Muḥammad Akbar Arzānī, Ḥakīm Muḥammad A'zam Khān, all stated that Waja'al-Mafāsil is caused mostly by Balghamī Khilṭ.^{8,15,16,32,33} in this study the prevalence of OA were found to be 85.29% of Balghamī type, which validates the statements of ancient Unani physician as mentioned above.

In this study bilateral OA of the knee joint found to be 99 (72.8%) [grade-1 19 (19.2%), grade-2 70 (70.7%), grade-3 10 (10.1%)], while involvement of unilateral knee joint, shoulder, ankle joint and calcaneal spur were also presented OA in 3 (2.20%), 30 (22.04%), 2 (1.47%) and 2 (1.47%) respectively. Huskisson et al states that knees were the most frequently affected joint and often the dominant source of symptoms, but the hands and other non-weight-bearing joints were also frequently involved.³⁴ Redha Alwan Ḥasan Al-Hāshimī states that there is a strong association between DM and frozen shoulders (FS). The ageing increased shoulder disorder distribution with the dominant side being mostly affected.²⁶ Both the above studies correlates with our study.

The present study has certain limitation first its is a hospital based cross sectional study and not a population

based study which may not be representative of the larger population, so the results cannot be generalised, further the cross sectional design limits the ability to establish causality or examine changes over time, we suggest a population based study with large sample size in future.

CONCLUSION

The present study showed that the significantly higher prevalence of OA was found to be 54.4% among diabetic patients, visited the hospital of the NIUM, Bengaluru. Mainly affected patients were females, having lower educational status as well as in lower socioeconomic status. The *Balghamī* type of *Waja'al-Mafāṣil* was of maximum (85%), which may be interpreted that the main cause of *Waja'al-Mafāṣil* was the *Balghamī Mizāj* of the patients, that is mentioned in classical Unani medical literatures, it means that the observations of Unani physicians were very keen and perfect. OA disability and inflammatory conditions were realized as important causes of pain, so it is necessary that diabetes patients should keep in check their blood glucose level regularly and control them with diet, and regular physical exercise so that they can prevent themselves from diabetic complications like OA.

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