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The Relationship between BMI and Joint Inflammation Control Rheumatoid Arthritis

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Abstract: Patient with the systemic autoimmune illness known as rheumatoid arthritis is brought on by a person`s immune system mistakenly attacking the joints' synovium, causing chronic damage to the joints. RA characterized by the inflammation of multiple joints and significant joint destruction and disability. Over time, joint inflammation causes bone erosion and cartilage loss, which at last leads to joint degeneration.

Methods: current study used a descriptive quantitative design with an application of observation, study group approach to detect how body mass index connection as well as the joint inflammation for adult patients who are diagnosed with RA for 150 patients in Al-Diwaniyah, Al-Hamza, and Al-Shamiya public hospitals in Iraq. Participant's Body Mass Index measured as well as ESR were documented from laboratory test.

Results: study reflect that the prevalence of joint inflammation was more in women than men. Also most of study sample suffering from overweight or obese for the most of sample that diagnosis with joint inflammation**.**

Conclusions: A higher body mass index can raise the likelihood of developing joint inflammation. However, the finding also highlights the stand in need of research on the correlation between body mass index as well as joint inflammation risk with adjustment for more agitating factors.

INTRODUCTION

In the recent years, as well as the prevalence of obesity and rheumatoid arthritis have been progressing. Therefore, itis important for conduct an comparison of rheumatoid arthritis (RA) and obesity or overweight. Given how prevalent it is and the numerous health issues it causes, obesity is perhaps the most concerning public health issue of our time. Thus, it is not surprising that obesity has a big impact on how rheumatoid arthritis is managed. Obesity is characterized by inflammation, and excess visceral adiposity is linked to increased levels of erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), and systemic cytokines.

During the last 30 years research has demonstrated that RA is a worldwide illness. The results of incidence and prevalence measurements. Nevertheless, vary based on the characteristics of the population and have evolved over time. (Safiri, S et al,. 2017). While the frequency of RA is only 0.24% worldwide(Cross M, Smith E ,et al 2014) , it was 1% in Iraq until 2019. The prevalence of the disease is 460 people per 100,000 people (Almutairi et al., 2021). There are 355 million people with arthritis in the world today (Cai Y, Zhang J, Liang J, Xiao M, Zhang G, Jing Z, et al 2023).

Rheumatoid arthritis (RA) and osteoarthritis (OA) are the two most common forms of arthritis in the world. Globally, the age-standardized prevalence of RA increased by 7.4% in 2017. In the meantime, osteoarthritis accounted for over 520 million cases in 2019, making it one of the most common incapacitating medical conditions (Bullock J et al. 2018) (Sparks JA., 2019).

Obesity increases the likelihood of developing RA in persons. proving that people with a greater body mass index have a greater chance of developing RA (Wesley A, Elkan AC, Bengtsson C, et al., 2013). The likelihood of developing RA was increased by a larger waist circumference and a higher body fat percentage. Women showed this outcome, but men did not (Lu B, Hiraki L, Sparks JA et al., 2014).

High BMI is a significant risk factor for the burden of osteoporotic Brazilian patients, according to the 2017 Global Burden of Disease Study (Wolf J et al, 2022).

BMI and dyslipidemia may play fundamental role in development of osteoarthritis in Iraqi patients (Hamzah, M I, et al, 2020). As a result, impacted people frequently experience a decline in their quality of life and restricted mobility. These factors are genetic, multifactorial, and include lifestyle, and environmental factors (Smolen , JS , et al 2016). Body weight, as determined by the body mass index (BMI), has been identified as one of the most important modifiable risk factors for the onset of some forms of arthritis, particularly osteoarthritis (OA) (Wolf J et al, 2022).

Today, obesity the second most common cause of preventable death after smoking (Lazarus, E et al , 2022). Many complications, such as metabolic and cardiovascular disorders, as well as the emergence of inflammatory diseases, are thought to result from obesity, which is regarded as a systemic disease. Obesity is in fact said to be very common in IRD and contributes to their development (Otón T, Carmona L.,2019), (Thamer W., 2019). People who are overweight or obese, especially abdominal obesity (Ye, R.Z et al., 2022) compared to those with healthy weight, are at increased risk for osteoarthritis (Ansari, S.,et al, 2020). Obesity is becoming increasingly common in Iraq and around the world.

The World Health Organization (WHO) reports that since 1975, the number of obese people worldwide has almost tripled, with over 1.9 billion adults being overweight and over 650 million obese in 2016. According to the Global Non-Communicable Disease (NCD) risk factor collaboration, if post-2000 trends continue, the prevalence of obesity worldwide will surpass 21% in women and reach 18% in men by 2025. (World Health Organization (WHO)., 2022). Obese patients were associated with worse disease activity. Weight reduction may be associated with clinical improvement (Mathkhor AJ,et al,. 2022). As outcome that, Obesity significantly impairs national and regional health and passively affects population morbidity and mortality (Tiwari A,. 2021)

For this reason, researcher feel the need to make observations about the relationship of body weight as measured by BMI and Joint inflammation in Al-Diwaniya Province/ Iraq.

METHODOLOGY

Current study used a descriptive quantitative design with an application of observation, study group approach to define the relationship between body mass index and joint inflammation for adult patients who are diagnosed with RA for 150 patients in Al- Diwaniyah, Al- Hamza, and Al-Shamiya public hospitals In Iraq. Participant's Body Mass Index measured and ESR were documented from laboratory test.

Study instrument: involves of the following :-

Demographics questionnaire: Age, gender, marital status, educational attainment, body mass index, and occupation of the respondent are all included in this partition.

Body Mass Index: Was computed by dividing the square of height by body weight (kg/m2). The BMI was divided into three categories: normal weight (BMI = 18.5–24.9 kg/m2), overweight (BMI ≥ 25 kg/m2), and underweight (BMI < 18.5 kg/m2).

Surgical alcohol (valera surgical spirit 70% made in U.A.E) was used to disinfect the instruments and hand sanitizing.

RESULTS

Table 1 demographic characteristic

Demographic variable		Frequency	Percent
GENDER	female	102	68.0
	male	48	32.0
	Total	150	100.0
Age	Mean 57.20		S.D = 11.85

Study result in table 1 show that 68% of study sample was female and the mean of age was 57.20 which reflect that the prevalence of joint inflammation was more in women than men.

Table 2 body mass index value for study sample

		Frequency	Percent	
BMI	normal	3	2.0	M=30.65 SD= 3.13
	overweight	93	62.0	
	obese	54	36.0	
	Total	150	100.0	

Table 2 show that most of study sample suffering from overweight or obese for the most of sample that diagnosis with joint inflammation

Table 3 ESR value value for study sample

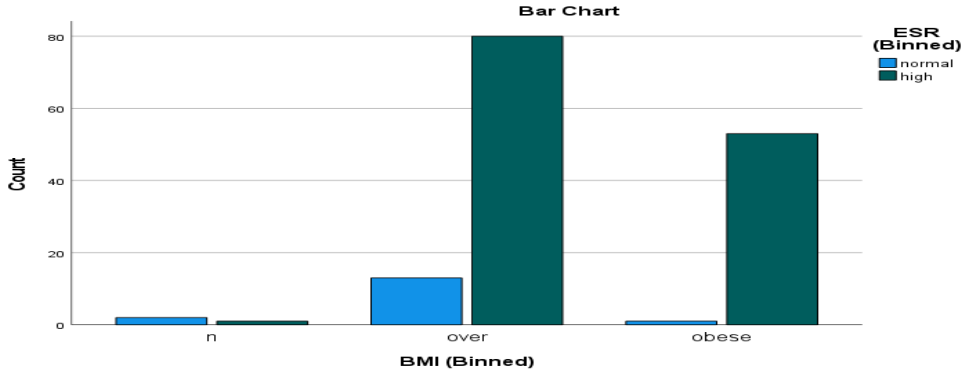
		Frequency	Percent	
ESR	normal	16	10.7	M= 35.65 SD= 17.714
	high	134	89.3	
	Total	150	100.0	

Table 3 indicate high value in ESR test for the most of study sample

Table 4 Correlations between BMI and ESR

		BMI	ESR
BMI	Pearson Correlation	1	.637**
	Sig. (2- tailed)		.000
	N	150	150

**. Correlation is significant at the 0.01 level (2-tailed).



ESR	P.Value
Overweight	0.001
Obese	0012

DISCUSSION

The present findings align with a prior meta-analysis that similarly identified an elevated the Rheumatoid arthritis risk is linked to a high body mass index. (1). Feng et al.(2) indicated that, based on data from five band studies and six case-control studies, the summary relative risk (RR) was 1.13 (95% CI 1.01–1.26, I2 = 84.0%) for every 5 kg/m2 increase in BMI. The variety of studies included in the current meta-analysis was significantly reduced compared to the prior meta-analysis, likely due to the exclusive inclusion studies of cohort. This mitigates recall bias as well as diminishes the likelihood of Inverse causality and selection bias. More band studies were included in this analysis, which improved risk estimates and made it easier to assess relationships between the risk of rheumatoid arthritis and other measures of adiposity, such as waist circumference and BMI in early adulthood (3,4). A recent Swedish study found no significant association between bariatric surgery and the incidence of rheumatoid arthritis (HR = 0.92, 95% CI 0.59-1.46), despite some studies suggesting that bariatric surgery may help people with rheumatoid arthritis with discomfort. However, the confidence intervals were wide and the statistical power to detect a moderate association might have been inadequate (5).

The ongoing research demonstrated which obesity or an elevated BMI heightens the risk of rheumatoid arthritis (RA). This finding aligned with a Mendelian randomization research involving 337, 159 individuals, which showed that a higher risk of RA was directly related to BMI [6]. Nonetheless, the mechanism that underpins the connection remains ambiguous.

This data corroborates previous studies indicating that obese persons with OA exhibited inferior performance on the TUG (7-8). According to research (9) patients with knee OA who have higher BMIs seem to perform worse on the TUG. Obesity correlates with biomechanical alterations in gait among persons with osteoarthritis, including extended activation of the quadriceps and gastrocnemius muscles, perhaps leading to prolonged contact load on the knee joint. Furthermore, obese patients with osteoarthritis exhibit heightened hind foot movements, resulting in forefoot abduction during ambulation, in contrast to their normal-weight counterparts (10-11).

CONCLUSION

An elevated BMI may contribute to a heightened risk of developing joint inflammation. Nevertheless, the results also underscore the need for further investigation into the relationship between body mass index and the risk of joint inflammation, controlling for additional agitating factors.

FINANCIAL DISCLOSURE

No financial information was disclosed.

CONFLICT OF INTEREST

Not any as an announce.

ETHICAL CLEARANCE

All experiments adhered to the agreed-to-perform procedures and were approved by the Al-Diwaniya Health Directorate in Iraq..

REFERENCES

1. Ansari, S., Haboubi, H. and Haboubi, N. (2020). Adult obesity complications: challenges and clinical impact. Therapeutic Advances in Endocrinology and Metabolism, 11, p.204201882093495Almutairi, K., Nossent, J., Preen, D., Keen, H., & Inderjeeth, C. (2021). The global prevalence of rheumatoid arthritis: A meta-analysis based on a systematic review. Rheumatoid. Int. 41: 863–877.
2. Bullock J, Rizvi SAA, Saleh AM, Ahmed SS, Do DP, Ansari RA, Ahmed J. Rheumatoid Arthritis: A Brief Overview of the Treatment. Med Princ Pract. 2018;27(6):501-507.

3. Cai Y, Zhang J, Liang J, Xiao M, Zhang G, Jing Z, et al. The burden of rheumatoid arthritis: findings from the 2019 global burden of diseases study and forecasts for 2030 by bayesian age-period-cohort analysis. *J Clin Med* (2023) *12*(4):1291.

4. Cross M, Smith E, Hoy D, Carmona L, Wolfe F, Vos T, Williams B, Gabriel S, Lassere M, Johns N, Buchbinder R, Woolf A, March L. The global burden of rheumatoid arthritis: estimates from the global burden of disease 2010 study. Ann Rheum Dis. 2014 Jul;73(7):1316-22.

5. Hamzah, M. I., Saed, M. R., Aldabagh, M. A. G. H., & Alwahab, H. S. A. (2020). Impact of Dyslipidemia and Body Mass Index (BMI) in Development of Osteoarthritis (OA)in Iraqi Patients. *Medico-Legal Update*, *20*(4).

6. Lazarus, E. and Bays, H.E., 2022. Cancer and obesity: an obesity medicine association (OMA) clinical practice statement (CPS) 2022. Obesity Pillars, 3, p.100026.

7. Lu B, Hiraki L, Sparks JA et al. Being overweight or obese and risk of developing rheumatoid arthritis among women: A prospective cohort study. Ann. Rheum. Dis. 73(11), 1914–1922 (2014)

8. Mathkhor AJ, Mardan FT, Allawi AB. Prevalence and impact of obesity in patients with rheumatoid arthritis. Curr Rheumatol Res. 2022;3(1):8- 12.

9. Otón T, Carmona L. The epidemiology of established rheumatoid arthritis. Best Pract Res Clin Rheumatol. 2019;*33*(5):101477.

10. Safiri S, Kolahi AA, Hoy D, Smith E, Bettampadi D, Mansournia MA, Almasi-Hashiani A, Ashrafi-Asgarabad A, Moradi-Lakeh M, Qorbani M, Collins G, Woolf AD, March L, Cross M. Global, regional and national burden of rheumatoid arthritis 1990-2017: a systematic analysis of the Global Burden of Disease study 2017. Ann Rheum Dis. 2019 Nov;*78(*11):1463-1471.

11. Smolen JS,Aletaha D, McInnes IB. Rheumatoid arthritis. Lancet. 2016 Oct 22;388(10055):2023-2038.

12. Sparks JA. Rheumatoid Arthritis. Ann Intern Med. 2019 Jan 01;170(1):ITC1-ITC16.

13. Tiwari A, Balasundaram P. Public health considerations regarding obesity. 2021

14. Thamer W. Study of some immunological effects of methotrexate in people with rheumatoid arthritis. Al-Qadisiyah J Pure Sci. 2019;24(2).

15. Wolf J, França EB, Assunção A. The burden of low back pain, rheumatoid arthritis, osteoarthritis, and gout and their respective attributable risk factors in Brazil: results of the GBD 2017 study. *Rev Soc Bras Med Trop* (2022) 55(suppl 1):e0285.

16. Wesley A, Bengtsson C, Elkan AC et al. Epidemiological investigation of rheumatoid arthritis study group. Association between body mass index and anti- citrullinated protein antibody positive and anti- citrullinated protein antibody-negative rheumatoid arthritis: results from a population-based case-control study. Arthritis. Care. Res. 65(1), 107–112 (2013).

17. *World Health Organization (WHO) Health Topics, Obesity.* https://www.who.int/health-topics/obesity#tab=tab_1, Date of access:2022.

18. Ye, R.Z., Richard, G., Gévry, N., Tchernof, A. and Carpentier, A.C., 2022. Fat cell size: measurement methods, pathophysiological origins, and relationships with metabolic dysregulations. Endocrine reviews, 43(1), pp.35-60.