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ORIGINAL ARTICLE

Prevalence of Irritable Bowel Syndrome and Metabolic Syndrome among Young Adults

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ABSTRACT

Background and Aim: Nutrient absorption, dietary pattern, and food ingestion might be affected by a common gastrointestinal disorder known as irritable bowel syndrome (IBS). Metabolic syndrome is significantly associated with nutrition-related parameters, inferring irritable bowel syndrome which increases the potential risk for metabolic syndrome (MS). The present study aimed to assess the incidence of irritable bowel syndrome and metabolic syndrome among young adults.

Methodology: This cross-sectional study was conducted on 428 adults between 16 and 60 years at the Department of Medicine and Gastroenterology, Isra University Hospital, Halaroad Hyderabad from January 2019 to December 2021. Anthropometry and biochemistry were used in screening out the individual health check-up. The presence and absence of metabolic syndrome were identified based on the results. Individuals with a history of metabolic syndrome or already on medication for dyslipidemia or diabetic Mellitus or hypertension were excluded.

Results: Of the total patients, the incidence of irritable bowel syndrome and metabolic syndrome was 18 (4.2%) and 132 (30.8%) respectively. The proportion of irritable bowel syndrome was insignificant in patients with or without metabolic syndrome (1.9% versus 4.1% respectively; p=0.5). Individuals with irritable bowel syndrome had a significantly higher mean weight 74.5 kg versus 66.8 kg; p=0.007). The mean value of body mass index, waist circumference, and fasting glucose was 27.6 versus 23.8 kg; p=0.001, 87.6 versus 84.3 cm, and 97 versus 88 mg/dl; p<0.000) respectively.

Conclusion: In our study, we discovered an insignificant association between irritable bowel syndrome and the presence or absence of metabolic syndrome in young adults. Furthermore, the study findings suggested that irritable bowel syndrome treatment could be used to prevent metabolic syndrome as a potentially beneficial factor.

Keywords: Irritable bowel syndrome, Metabolic syndrome, Prevalence, Young adults.

INTRODUCTION

The recurrent abdominal pain and discomfort associated with disturbed bowel habits episodes characterized a common gastrointestinal disorder known as Irritable bowel syndrome (IBS) [1, 2]. Most patients with irritable bowel syndrome are conscious of avoiding certain foods and dietary patterns which may trigger these episodes [3, 4]. Additionally, nutrient absorption and food digestion are disrupted by irritable bowel syndrome [5]. The risk for cardiovascular disease is well-recognized gathered by Metabolic syndrome (MS), contributing to majority of morbidity and mortality cases [6]. According to the evidence, dietary factors are the foundation for the metabolic syndrome prevention and treatment [7]. The prevalence of IBS in developing countries ranges between 4.2 and 7.9% [8, 9] and is unquestionably lower than in developed countries. This could be due to cultural and dietary factors, as well as the sensitivity of the diagnostic criteria.

Metabolic syndrome, an accumulation of various risk factors such as obesity, dyslipidemia, and increased blood pressure, and dysglycemia is considered as the pioneer of cardiometabolic disorders like corona artery disease and diabetes mellitus [10]. Previous researches across urban population reported fairly common metabolic syndrome approximately 26% to 31.6% among young population. As a result, a dietary pattern study may be a more important tool for evaluating the effects of diet on health than a single nutrient in foods or a single food [11, 12]. Irritable bowel syndrome can have an impact on dietary patterns, nutrient absorption, and food digestion all of which are significant factors in the metabolic syndrome prevention and treatment. As a result, metabolic syndrome could be caused by IBS as a risk factor. However, few epidemiological studies in an adult population have examined the association between IBS and MS. Given the preceding studies and the potential etiopathogenic link between IBS and metabolic syndrome, the current study was conducted to determine the prevalence of metabolic syndrome and IBS.

METHODOLOGY

This cross-sectional study was conducted on 428 adults between 16 and 60 years at the Department of Medicine and Gastroenterology, Isra University Hospital, Halaroad Hyderabad from January 2019 to December 2021. Anthropometry and biochemistry were used in screening out the individual health check-up. The presence and absence of metabolic syndrome were identified based on the results. Individuals with a history of metabolic syndrome or already on medication for dyslipidemia or diabetic Mellitus or hypertension were excluded. Based on the prevalence of metabolic syndrome, the sample size was calculated. The sample size was estimated to be 428 based on a 9.8 percent incidence of metabolic syndrome in the general population, a 4 percent margin of error in estimation, a 5% level of significance, and an 80 percent power.

A questionnaires based proforma was completed by the participant after taking informed consent. Clinical examination includes weight, height, blood pressure, waist circumference, and systemic examination and laboratory findings such as blood sugar level and lipid profile were done for the diagnosis of metabolic syndrome. Digital weighting scale and calibrated stadiometer was used for the accurate measurements of weight and height respectively. Non-extensible tape was used for measuring the waist circumference. A calibrated sphygmomanometer was used for blood pressure measurement. A participant was classified as having metabolic syndrome based on the following criteria: waist circumference increase above 90 cm for male and for females above 80 cm, x elevated triglycerides (>150 mg/dL), increased, decreased HDL cholesterol from 40 mg/dL for males and above 50 mg/dL for females, and elevated fasting glucose (100 mg/dL).

RESULTS

Of the total patients, the incidence of irritable bowel syndrome and metabolic syndrome was 18 (4.2%) and 132 (30.8%) respectively. The proportion of irritable bowel syndrome was insignificant in patients with or without metabolic syndrome (1.9% versus 4.1% respectively; p=0.5). Individuals with irritable bowel syndrome had a significantly higher mean weight 74.5 kg versus 66.8 kg; p=0.007). The mean value of body mass index, waist circumference, and fasting glucose was 27.6 versus 23.8 kg; p=0.001, 87.6 versus 84.3 cm, and 97 versus 88 mg/dl; p<0.000) respectively. Demographic details of all the patients with or without IBS is shown in Table-1. Age-wise distribution is illustrated in Figure-1. Prevalence of the five metabolic syndrome-defining criteria among participants with metabolic syndrome is shown in Figure-2. Table-II represents the association of irritable bowel syndrome with metabolic syndrome. The distribution of the five

metabolic syndrome-defining criteria among irritable bowel syndrome participants (n = 18) is illustrated in Figure-3.

Table 1: Demographic details of all the patients with or without IBS

Parameters	IBS Mean ± SD (n=18)	No IBS Mean ± SD (n=132)	P-value
Age (years)	36.4±6.9	35.9±7.2	0.14
Gender (Male %)	74.7	76.5	0.92
Weight (Kg)	74.5	66.8	0.007
Waist Circumference (cm)	87.6	84.3	<0.000
BMI (kg/m2)	27.6	23.8	0.001
SBP (mm Hg)	117.45 ± 12.9	118.3 ± 7.82	0.51
DBP (mm Hg)	74.07 ± 6.78	72.12 ± 4.82	0.203
TG level (mg/dl)	126.72 ± 71.35	116.23 ± 52.63	0.432
HDL Cholesterol (mg/dl)	38.53 ± 8.21	41.09 ± 10.41	0.243
Fasting Glucose (mg/dl)	97	88	<0.000

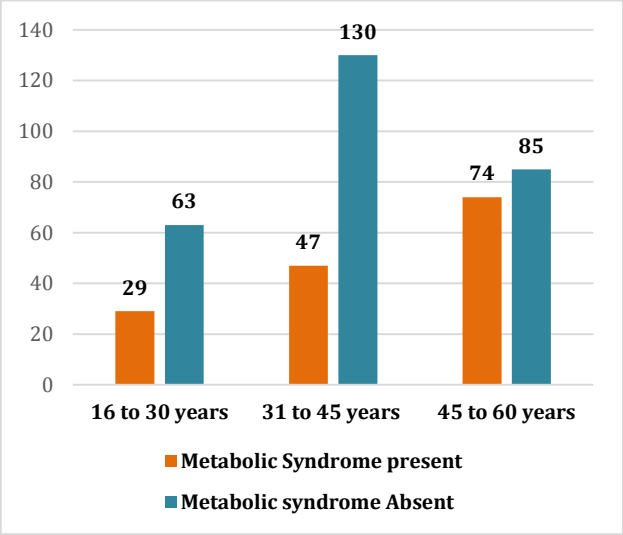

Figure 1: Age-wise distribution

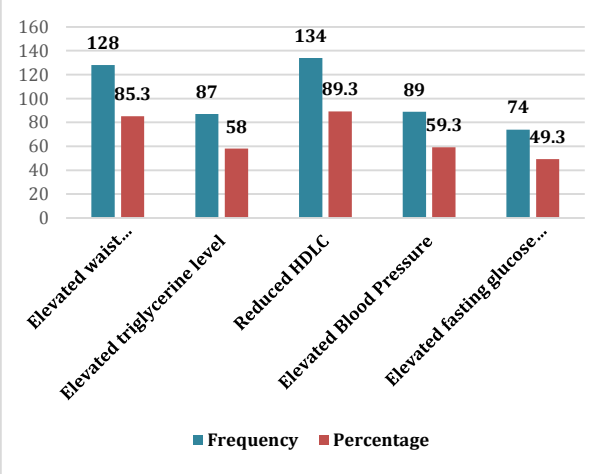

Figure 2: Prevalence of the five metabolic syndrome-defining criteria among participants with metabolic syndrome

Table 2: association of irritable bowel syndrome with metabolic syndrome

Irritable Bowel Syndrome	Metabolic syndrome Yes	Metabolic syndrome No	P-value
	(N=150)	(N=278)	
Yes	3 (1.9)	15 (4.1)	0.05
No	147 (98.1)	263 (95.9)	

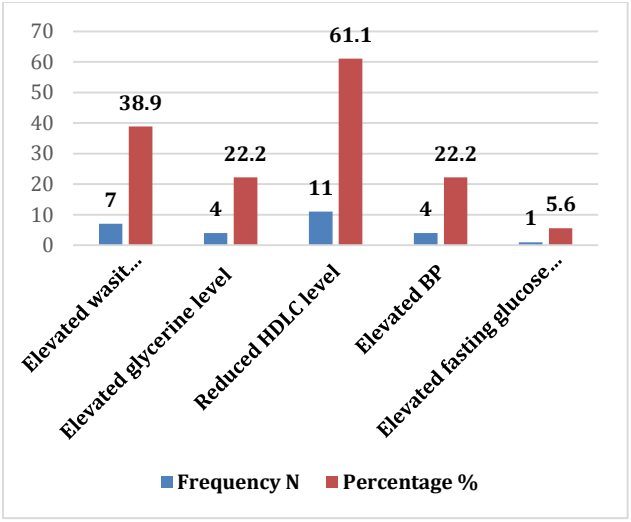

Figure 3: distribution of the five metabolic syndrome-defining criteria among irritable bowel syndrome participants (n = 18)

DISCUSSION

The present study investigated the association of metabolic syndrome with irritable bowel syndrome among young adults. It has been found that an insignificant association between irritable bowel syndrome and the presence or absence of metabolic syndrome in young adults. Furthermore, the study findings suggested that irritable bowel syndrome treatment could be used to prevent metabolic syndrome as a potentially beneficial factor. However, elevated triglyceride level is significantly associated with irritable bowel syndrome. Additionally, insignificant associations between dietary patterns and irritable bowel syndrome were observed. Cardio metabolic disorders have been potentially supported by host metabolism revealing intriguing associations with the gut micro biome [13, 14].

The present study excluded all those patients with a history of diabetes mellitus, hypertension, and dyslipidemia which in turn, lower the prevalence of metabolic syndrome by 35% compared to other studies finding 39% and 41% [15, 16]. The present study found significant variation in reduced HDLC cholesterol and obesity being the prevalent factors. Similar findings were reported in the previous studies conducted by Gómez-Ambrosi et al, and Le-pluart et al [17, 18].

Wiebe et al, discovered that the age group 51–60 years had the highest prevalence [19]. In the current study, incidence reported was lower due to the exclusion of patients above 60 years of age. Irritable bowel syndrome is symptomatic disorder. The variance in the IBS symptoms might be due to sociocultural disparities across the country.

Metabolic syndrome has been adversely affected by irritable bowel syndrome due to variation in nutrient absorption, dietary pattern, and food digestion as hypothesized. Yet, dietary pattern and irritable bowel syndrome had insignificant association. Similar findings regarding dietary habits insignificant association with irritable bowel syndrome was reported in previous studies [20, 21].

Gut microbiot, on contrary had significantly associated with metabolic sand irritable bowel syndrome. Additionally, gut microbiota is strongly associated with both qualitative and quantitative changes in irritable bowel syndrome [22]. Because the gut microbiota is becoming increasingly recognized as a risk factor for the treatment and prevention of MS [23].

In contrast to a previous study, the present study found insignificance association of irritable bowel syndrome to metabolic syndrome [24]. It has been known that functional bowel disorder is not only irritable bowel syndrome but could be manifested by bowel dysfunction in various ways as it is strongly related to metabolic syndrome. Additionally, these entities surreptitious

nature could leads to consequent bias of inherited antecedent due to study limitations. Patients with history of metabolic syndrome were excluded to substitute the confounding effects of variations in diet, lifestyle, and drugs like statins, metformin, and guts function anti-hypertensive drugs [25].

In the present study, all the irritable bowel syndrome patients had higher mean value of weight, fasting glucose level, waist circumference, lower HDLC level, and BMI. All these parameters or factors were significantly related to irritable bowel syndrome. Similar findings were found in Ivancovsky et al study [26]. Also, Irritable bowel syndrome is significantly associated with waist circumference. Another study conducted by Nauman et al reported similar findings and results [27]. Egyptian's based study reported significance relation between irritable bowel syndrome and higher body mass index which resemble our study findings [28]. IBS and metabolic syndrome are complex, multifactorial disorders with deceptive symptoms and far-reaching consequences. The study's negative findings do not rule out the possibility of a link between metabolic syndrome and functional GI disorders such as IBS.

CONCLUSION

In our study, we discovered an insignificant association between irritable bowel syndrome and the presence or absence of metabolic syndrome in young adults. Furthermore, the study findings suggested that irritable bowel syndrome treatment could be used to prevent metabolic syndrome as a potentially beneficial factor.

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