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RESEARCH ARTICLE

ASSOCIATION BETWEEN BODY MASS INDEX AND SEVERITY OF CHOLECYSTITIS.

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Abstract

Obesity is an established risk factor for gall stone disease and Few studies have also reported male sex as an independent predictor for the severity of cholecystitis. There has been many a studies describing the various causative factors and their role in the development of gallstones, but their association with the severity of cholecystitis has been less studied. It is also postulated that the total body fat, the mean value of which is significantly higher for females than males, may contribute to the difference in the severity of cholecystitis between the two sexes.

Methods:-To study the association between body mass index and severity of cholecystitis, a prospective study was carried out on 100 patients of cholecystitis whose weight and height measurements were recorded on admission and the patients were stratified in two groups - Obese (BMI " >25kg/m2) and Non-Obese (BMI < 25kg/m2). The association between BMI and severity of cholecystitis was investigated.

Results:-Of the 100 patients included in the study, 64 patients (64%) were chronic cases of cholecystitis, 23 cases (23%) were diagnosed as uncomplicated acute cholecystitis and 13 patients were having complicated acute cholecystitis. Among the complicated cases, empyema was noted in 6 patients and peri- cholecystic abscess in 3 patients. 56 patients (56%) of the 100 patients who were studied were obese and 44 patients (44%) were non-obese. In case of males, the proportion of complicated acute cholecystitis was higher in non-obese patients (24%) compared with obese patients (2.8%). The results were statistically significant (p=0.0412). In case of females, there was no significant difference in proportion of complicated acute cholecystitis in obese and non-obese patients(p= 0.538).

Conclusionn:- BMI was found to be negatively correlated with the severity of cholecystitis in males, resulting in higher incidence of severe cholecystitis in the non-obese male patients.

Introduction:-

Obesity is an established risk factor for gall stone disease [1] . An acute reduction of body weight also predisposes a person to cholelithiasis[2,3], but the cause of which is not clearly identified yet. There has been many a studies describing the various causative factors and their role in the development of gallstones, but their association with the severity of cholecystitis has been less studied. Few studies have also reported male sex as an independent predictor for severity of cholecystitis[4,5,6]. Many physiological differences between the two sexes can be examined, for the possible differences in the severity of cholecystitis between the two sexes; total body fat, the mean value of which is significantly higher for females than males, may contribute to this sex difference. We therefore performed a study to know the association of BMI with the severity of cholecystitis and its relationship with regards to the sex differences for this disease.

Materials and methods:

This is a prospective study carried out on 100 patients for cholecystitis admitted in Genral surgery Deptt. Of SMHS hospital Srinagar. Severity of the inflammation was graded as (a) Chronic Cholecystitis (b) Uncomplicated Acute Cholecystitis (c) Complicated Acute Cholecystitis. The patients with chronic cholecystitis were electively operated on, and those patients with acute cholecystitis were operated on during their initial admission when they were stabilized or at a later date. Uncomplicated Acute cholecystitis was clinically defined by the presence of fever >37.50^{0}C, right upper abdominal pain and tenderness with persistence of symptoms for more than 48 hours despite medical treatment. The operative findings included – adhesions to adjacent organs, gross inflammation of gall bladder serosa and gall bladder wall thickness more than 4 mm. Complicated acute cholecystitis was defined by the presence of life threatening complications such as empyema, peri-cholecystic abscess or gangrene. BMI was calculated by dividing the patients weight (kg) by the square of the height (in meters). Patients were placed in two groups – Obese (BMI > 25kg/ m2) or Non-Obese (BMI < 25kg/m2). The association between BMI and severity of cholecystitis was investigated. The preoperative data were Age , Sex, BMI and Preoperative treatment days.

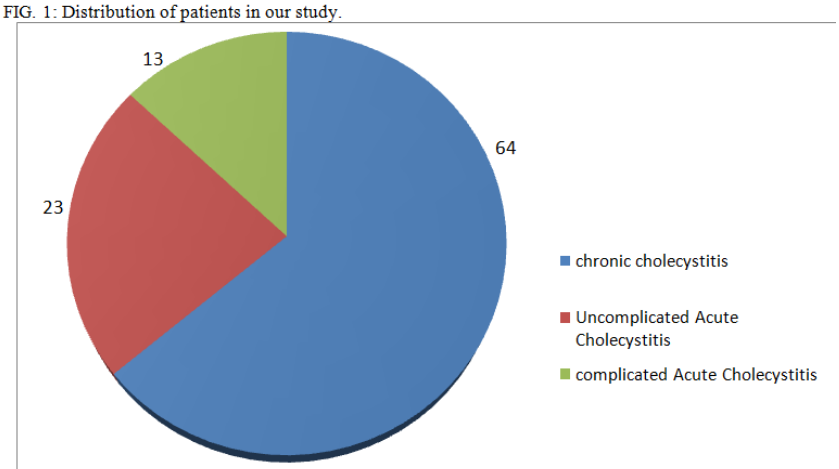
Statistical analysis:

The data was analyzed and compared using the Chi-Square test and a p value of < 0.05 was considered statistically significant.

Results:

Of the 100 patients included in the study, 64 patients (64%) were chronic cases of cholecystitis, 23 cases (23%) were diagnosed as uncomplicated acute cholecystitis and complicated acute cholecystitis was seen in 13 patients (13%) (Fig 1). Among the complicated cases, empyema was noted in 6 patients and peri-cholecystic abscess in 3 patients. 56 patients (56%) of the 100 patients who were studied were obese and 44 patients (44%) were non-obese. For the males there was a significant negative correlation between BMI and the severity of cholecystitis. The proportion of complicated acute cholecysitis was higher in non-obese (24%) patients compared with the Obese (2.8%) patients (Table 1), while as the proportion of chronic cholecystitis was more in obese (74%) patients than in Non-obese (56%) patients (Table 2).The relationship was insignificant in females.

FIG. 1: Distribution of patients in our study.



Pie Chart showing percentage distribution of patients in our study.

Table:-1 The severity of cholecystitis according to BMI in males.

	BMI < 25 kg/m^2 (n = 25)	BMI ≥ 25 kg/m^2 (n = 35)
CC	14 (56%)	26 (74%)
Uncomplicated AC	5 (20%)	8 (22.8%)
Complicated AC	6 (24%)	1 (2.8%)

P value = 0.0412

Table:-2 The severity of cholecystitis according to BMI in Females.

	BMI < 25 kg/m^2 (n = 19)	BMI ≥ 25kg/m^2 (n = 21)
CC	10 (52.6%)	14 (66.6%)
Uncomplicated AC	5 (26.3%)	5 (23.8%)
Complicated AC	4 (21.0%)	2 (9.5%)

P value = 0.538

Discussion:-

Obesity is a well known risk factor for the formation of Gall Stones and BMI is commonly used as a measure of Obesity. Not only overweight /obesity, but weight loss also increases the risk of gallbladder disease. The three factors – cholesterol supersaturation of bile, impaired gall bladder motility and nucleation defects are further increased during weight loss[7].This study focusses upon the relationship between Body Mass Index and the severity of cholecystitis. The cut off point of 25 kg /m2 is mentioned by the International Obesity Task Force for Asian and Pacific Island populations of WHO [8]. This study showed that there is a higher incidence of severe cholecystitis in the non-obese males . The reason why severe cholecystitis occurs more frequently in non obese patients canot be answered from this study alone. A possible explanation is that the body fat may have a protective effect on the inflammatory process of cholecystitis. This study also reports that the non-obese male patients were predisposed to complicated cholecystitis, but this was not seen in the non-obese female patients. Epidemiological studies have shown that BMI is sex dependent when it is used as an indicator of body fatness [9,10]. For the same BMI, women have significantly greater amounts of total body fat than do men throughout the entire adult life span. The higher content of body fat in females compared with the males with the same BMI may explain the reason why the negative association was not seen in females.

Conclusion:

We found a negative correlation between BMI and the severity of cholecystitis in males resulting in a higher incidence of severe cholecystitis in non obese males.

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