

Hiatus Hernia and Body Mass Index (BMI): A Possible Correlation?

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Abstract INTRODUCTION: Hiatus hernia is the protrusion of the stomach or part of it through the oesophagus or a defect in the diaphragm into the thoracic cavity. Hiatus hernia is associated mainly with obesity and is sometimes encountered in patients with dyspepsia. Hiatus hernia can make worse the symptoms of dyspepsia especially in patients with reflux disease where it can cause non- cardiac chest pain or interferes with the acid pocket where there is a postprandial reflux of acid into the esophagus from the fundic area of the stomach. AIM: The aim of this study was to enroll patients coming for upper GIT endoscopy because of dyspepsia or peptic ulcer disease and were found to have hiatus hernia accidentally or as part of the reasons for referral to the endoscopy clinic. OBJECTIVE: The objective of this survey was to determine solely the relationship between hiatus hernia and body mass index of patients who were sent to the endoscopy clinic for upper gastrointestinal endoscopy for the suspected diagnosis of peptic ulcer disease or gastroesophageal reflux disease. METHOD: This was a prospective study between June 2010 and June 2016, the survey was conducted in two different centres in the north central part of Nigeria. Two consultant Gastroenterologists who also performed endoscopy on regular basis participated in the study. Consecutive patients who presented to the endoscopy clinic for the diagnostic upper GIT endoscopy were enrolled in the study. Patients who were found to have hiatus hernia by Hills classification had their weight and height recorded and their body mass index calculated. RESULT: Hiatus Hernia was found to be commoner in women but it was not found to be associated with obesity. Patient with the BMI indicating overweight had the highest rate of herniation while the obese individuals had the lowest. CONCLUSION: Obesity was not found to be associated with hiatus hernia and it may be possible that the rate of hiatus hernia may have a negative correlation with increasing BMI above 30Kg/M².

Keywords: *hiatus hernia, diagnostic upper GIT endoscopy and body mass index*

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1. Introduction/Literature Review

Hiatus hernia has been described in various ways but usually this is the protrusion of part of the stomach through the esophageal hiatus into the thorax. In a vast majority of people hiatus hernia is unnoticed and affected individuals are mostly asymptomatic [1]. In the developed world, hiatus hernia has been reported to be fairly common and most of such documentations were among the elderly individuals².

There is under reporting of the incidence of hiatus hernia in the general population in the less developed countries like Nigeria. This may be due to lack of recognition of the disease entity or paucity of endoscopic and other radiological tools necessary for its diagnosis or both [3].

Hiatus hernias are sometimes encountered in patients with symptoms of gastroesophageal reflux disease or other acid related disorders like peptic ulcer disease during diagnostic upper gastrointestinal endoscopy. Sometimes

hiatus hernia has been found incidentally in some patients during endoscopic procedures.

It is possible to classify hiatus hernia into a sliding type of hiatus hernia in which the gastro-esophageal junction moves up into the thorax. This type of hiatus hernia is seen in about 95 % of individuals at presentation.

Another type of hiatus hernia is the para-esophageal hiatus hernia previously referred to as the rolling type of hiatus hernia. This rolling type of hiatus hernia is however not as common in individuals in whom hiatus hernia has been reported. It is seen in about 5% of cases so reported. In this type of hiatus hernia, the gastro-esophageal junction remains in position while the stomach herniates beside the esophagus [4].

There is also the mixed type of hernia as well as the fourth type involving the herniation of both the stomach and the bowels as well.

Contrary to expectations, a large number of patients with mild and less frequent herniations are symptomless. Some may have other symptoms of the primary underlying diseases at presentation and it is thus less clear for milder hernias. Certain specific symptoms might be able to point

to the presence of the disease to allow for an early detection and subsequent intervention when and if necessary [5].

The common symptoms that has been noted include heartburn, regurgitation and dysphagia which are largely suggestive of gastroesophageal reflux disease. Large hernias may however present with chest pain, dyspnea and Globus hystericus. Very rarely strangulation of the bowel or esophagus may occur in very large hiatus hernia with very slow recoil [5].

Certain risk factors have been reported to be associated with hiatus hernia in individuals studied. The commonest among these is obesity which has a wider documentation. Other risk factors seem to be related to pressure effect in the abdomen affecting the stomach and other viscera such as chronic cough, violent vomiting, prolonged straining at defecation. Others include cigarette smoking, stress and diaphragmatic weakness.

Hiatus hernia has traditionally been diagnosed by diagnostic upper gastrointestinal endoscopy but other modes of diagnosis have been found to be very useful such as high resolution esophageal manometry, chest X-Ray and chest CT scan. The Hills classification has been used widely in the diagnosis of hiatus hernia since the gastroesophageal junction is not static and difficulty may exist in the measurement of the actual length of the hernia even under ideal conditions hence the endoscopists having to agree to the 2cm cutoff. Moreover, the Hills classification (1-4), has been found to be superior to the axial measurement and is readily reproducible [6].

The initial management of hiatus hernia certainly will depend on the type and whether there are symptoms either alone or related to an underlying disorder such as gastroesophageal reflux disease. Such management options might include elimination of risk factors, elevation of the head of bed at night, delay in lying down immediately after meal, weight reduction cessation of cigarette and alcohol and avoidance of substances that can reduce the lower esophageal sphincter tone [7].

Other modes of management include the use of antiulcer drugs such as the proton pump inhibitors to treat the associated symptoms of GERD and also the use of pro-motility agents such as domperidone or metoclopramide.

It is possible that patients with types three or four hiatus hernia may benefit from surgery in chronic cases and lack of response to both the initial non-medical and medical managements. Nissen fundoplication in which the fundus of the stomach is wrapped around the lower part of the esophagus is carried out for some of the patients laparoscopically. This has been found to prevent herniation and acid reflux in some patients but the complications of the surgery itself may be disturbing such as gas bloating syndrome, dysphagia and dumping syndrome [8].

In general, however, hiatus hernia may be complicated by GERD, Barrett's esophagus, esophageal cancer, Stomach strangulation and atelectasis amongst others.

2. Inclusion Criteria

Patients who had successful diagnostic upper GIT endoscopy and had hiatus hernia diagnosed by Hills classification at endoscopy were enrolled in the study

regardless of the indication for the procedure or whether the diagnosis of the hiatus was incidental.

3. Exclusion Criteria

Patients who had successful diagnostic upper GIT endoscopy performed but with no evidence of hiatus hernia were excluded from the study.

4. Method

This was a prospective study of diagnostic upper gastrointestinal tract endoscopies that were done in two different centres between the period of June 2010 and June 2016. These centres consisted of a federal medical centre in Nassarawa state that attends to patients in the North central region consisting of both urban and rural areas. The second centre is Bingham University Teaching Hospital which is a teaching hospital located in the city of Jos which also serves as a centre for community service and teaching and as well as a referral centre receiving patients from the neighbouring states.

There were two participating consultants in these centres who were responsible for performing the diagnostic upper gastrointestinal tract endoscopies. The same type of endoscopy machine was used during the period of study, which was the Olympus GIF Type V set.

Diagnostic upper gastrointestinal tract endoscopies were done twice in a week at both centres with an attending nurse and other resident doctors in attendance. Consecutive patients who presented to the endoscopy clinics for the diagnostic upper GIT endoscopy and who had a successful upper GIT endoscopy done and were found to have hiatus hernia by Hills classification were enrolled in the study.

A successful diagnostic upper GIT endoscopy was defined as the procedure where the duodenum was intubated and the second part of it clearly visualised and examined before withdrawal of the scopes.

The diagnostic upper GIT endoscopies were performed without sedation but with 10mg Xylocaine spray to the throat before the procedures. The procedure was explained to the patient in the native Hausa language as well as in English language by an assistant and a verbal consent was obtained before the procedure.

The average time for each procedure was put at 10 + or - 5 minutes. No complications were recorded during the period of study and patients were discharged almost immediately after the procedure.

Patients who were found to have hiatus hernia had their weight and height recorded for the purpose of the study. The same weighing scale with a rule attached to it was used in both centres. Patients were weighed without any shoe but with very light clothing while the heights were taken without the cap for males or the head gear for females. The BMI was calculated using the formula below:

$$\text{BMI} = \text{Weight (kg)} / \text{Height (Metre)}^2$$

The obtained data was entered into the system and analysed using the IBM SPSS version 20.

5. Results

There were total of 61 patients with hiatus hernia diagnosed during the study period. A total of 39 (63.9 %) were females while 22 (36.1 %) were males as shown in [Table 1](#) below.

Table 1. Showing the sex distribution of the patients

SEX	Frequency	Percent
F	39	63.9
M	22	36.1
Total	61	100.0

Considering the BMI of the patients, the classification below was used

BMI (Kg/m ²)	OBESITY CLASS
UNDERWEIGHT	18.5
NORMAL	18.5-24.9
OVERWEIGHT	25.0-29.9
OBESITY	30-34.9 I
	35.0-39.9 II
EXTREME OBESITY	40.0 + III

11 (18 %) were underweight, 18 (29.5 %) had ideal body weight, 22 (36.1 %) were overweight while 10 (16.4 %) were found to be obese as shown in [Table 2](#) below.

Table 2. Showing the BMI of the patients

	Frequency	Percent	Cumulative Percent
UNDERWEIGHT	11	18.0	18.0
IDEAL WEIGHT	18	29.5	47.5
Valid OVERWEIGHT	22	36.1	83.6
OBESITY	10	16.4	100.0
Total	61	100.0	

The test statistic done based on the findings in [Table 2](#) above, with a p-value of 0.091 > .05 showed that there is no association between hiatus hernia and BMI. However, the overweight patients had the highest frequency while the obese patients had the lowest frequency. This is shown in [Table 2](#).

Table 3. Showing the chi square test for the bmi and sex with bmi

	BMI_GROUP	SEX
Chi-Square	6.475 ^a	4.738
df	3	1
Asymp. Sig.	.091	.030

Based on the findings in [Table 1](#) above and on a p-value of 0.03, Chi-square test for goodness of fit was used for the analysis assuming the distribution of the patients based on sex and BMI group is uniform, it was found that there is an association between sex and hiatus hernia. Females appear to be more likely to have hiatus hernia more than their male counterparts. Again this is shown in [Table 3](#) above.

6. Discussion

From the results above, one could see that there is no association between obesity and hiatus hernia, this is a

contradiction to the study by Roman S and KahrilasPJ who had earlier postulated that obesity is the commonest cause of hiatus hernia. The study actually showed that patients with ideal body weight and overweight also had hiatus hernia more than the obese patients in the group. This is an important finding considering Nigeria with a prevalence of overweight individuals ranged from 20.3% - 35.1% while the prevalence of obesity ranged from 8.1% - 22.2%. This suggests that adiposity may be associated with hiatus hernia.

None of the patients had any congenital defect that would have predisposed them to the hernia when asked after the endoscopy and they also were not subjected to other modalities of investigation trying to find the cause of the hernia.

It is also noteworthy that female gender is a risk factor for developing hiatus hernia as more females have been shown in the study to have more tendencies to develop hiatus hernia compared to their male counterparts. Although none of the female patients were pregnant, presence of additional viscera and pregnancy can increase the intra-abdominal pressure in the woman increasing the risk of herniation more than their male counterparts.

Hiatal hernias seems to be a common finding in a lot of setting and in the early stages when they are small they are usually without symptoms hence the delay in the diagnosis until when such individuals or patients are seen in the endoscopy room due to GERD or dyspepsia [9].

Patients with hiatus hernia and GERD may have increased frequency and duration of symptoms of the latter due to the presence of the hernia [10,11].

It may be difficult to differentiate between the symptoms of hiatus hernia based on the size or coexistence with GERD as the symptoms are less specific and less frequent without the latter.

7. Conclusion

It can be concluded from this study that higher body mass index above 30Kg/M² has a negative association with hiatus hernia while the risk seems higher in women and those with BMI indicating overweight. More studies need to be done to confirm this finding.

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