Journal of Cardiovascular Disease Research

ISSN:0975 -3583,0976-2833 VOL 15, ISSUE 01, 2024

**Original research article**

# A STUDY ON COMMON SURGICAL DISEASES AND ITS CORRELATION WITH BMI

**[1]Dr. Jeevan G, [2]Dr. Santhosh CS, [3]Dr. Harish Kumar C, [4]Pranathi Murthy**

[1]Post graduate student, Department of General Surgery, Bangalore Medical College and Research Institute, Bangalore, Karnataka, India

[2]Professor, Department of General Surgery, Bangalore Medical College and Research Institute, Bangalore, Karnataka, India

[3]Assistant Professor, Department of General Surgery, Bangalore Medical College and Research Institute, Bangalore, Karnataka, India

[4]Student, Vidya Mandir Ind. PU College, Malleshwaram, Bangalore, Karnataka, India

**Corresponding Author:**

Dr. Jeevan G

**Abstract**

In surgical diseases, obesity is a significant risk factor for wound infection, more surgical blood loss and a longer post-operative time and increased risk of venous thromboembolism due to impairment of cardiac, pulmonary, and immunological functions. Underweight patients are at more risk for post-operative complications, including long term mortality. We obtained data prospectively from 1540 patients attending General surgery OPD from October 2022- December 2022 in Victoria hospital. Height, weight, BMI was calculated after Detailed history and clinical examination is noted. we found that hernias and varicose veins were more common with the patients with more weight. Obese patients more tend to have hernias than normal weight patients. Most patients with breast lumps belong to obese grade 2 class. In developing countries like india, where there is a stage of nutritional transition particularly in urban areas, the problems of undernutrition and over-nutrition should be addressed.

**Keywords:** Common Surgical Diseases, BMI, Obesity

## Introduction

Body mass index also known as Quetelet's index is defined as weight in kgs/square of height in meters, and is expressed in units of $kg/m^2$. BMI is an inexpensive and easy screening measure used to broadly categorise a person as underweight, normal weight, overweight, or obese based on tissue mass (Muscle, fat, bone) and height. BMI does not measure body fat directly, but BMI is moderately correlated with more direct measures of body fat. Overweight and obese personal are increasing worldwide [1, 2] and the problem of under -nutrition has been a major health concern in developing countries since many decades. As both under-nutrition and over-nutrition can increase the risk of

ISSN:0975 -3583,0976-2833 VOL 15, ISSUE 01, 2024

several diseases, the magnitude of both the conditions becomes an important public health issue [3]. In surgical diseases, obesity is a significant risk factor for wound infection, more surgical blood loss and a longer post-operative time and increased risk of venous thromboembolism due to impairment of cardiac, pulmonary, and immunological functions. Underweight patients are at more risk for post-operative complications, including long term mortality. It is well known that obesity has been associated with development of diabetes mellitus, hypertension, cardiovascular disease, heart failure, cancers, varicose veins etc. Despite the association of obesity with the development of chronic disease states that lead to early mortality, a number of recent studies have described an "obesity paradox", in which an improved survival has been observed in obese patients with heart failure, those undergoing coronary bypass. A very little information is known about the co- occurrence of surgical diseases with obesity and underweight. This study will facilitate comprehensive evaluation of the risk of common surgical diseases such as umbilical hernia, inguinal hernia, incisional hernia, varicose veins, diabetic foot ulcer, appendicitis, pancreatitis, liver abscess etc. among people with different BMI. This study aims at assessing the differences in BMI distributions and their changes by sex and age in various surgical diseases. In this study, we aim to calculate BMI in all patients attending surgery OPD irrespective of whether they need surgery or not, and then the association of particular surgical disease is correlated with different categories of BMI, height and weight.

**Methodology**

We obtained data prospectively from 1540 patients attending General surgery OPD from October 2022- December 2022 in Victoria hospital. Height, weight, BMI was calculated after Detailed history and clinical examination is noted.

**Inclusion Criteria**

1. Patients willing to give informed written consent.
2. Patients attending general surgery OPD with surgical complaints.

**Exclusion Criteria**

1. Patients with non-surgical complaints.
2. Pregnant women

**Statistical analysis**

**SPSS (Statistical Package for Social Sciences)** version 21. (IBM SPASS statistics [IBM corporation: NY, USA]) was used to perform the statistical analysis

- Data was entered in the excel spread sheet.
- Descriptive statistics of the explanatory and outcome variables were calculated by mean, standard deviation for quantitative variables, frequency and proportions for qualitative variables.
- Inferential statistics like
- Chi-square test was applied to find the association between Height, weight, BMI and Clinical Diagnosis.
- The level of significance is set at 5%

ISSN:0975 -3583,0976-2833 VOL 15, ISSUE 01, 2024

**Results**

There were total of 1540 patients studied. There were 937 males and 603 females presented to our OPD. The most common complaint presented to our OPD was Pain abdomen, followed by hernias in all BMI categories where as in obese grade 2 category Hernia found to be the most common surgical condition.

**Table 1:** Mean age distribution of the subjects

| | N | Minimum | Maximum | Mean | S.D |
|---|---|---|---|---|---|
| AGE | 1540 | 13.0 | 100.0 | 43.88 | 15.08 |

**Table 2:** Distribution of the subjects based on age groups

| Age Groups | Frequency | Percent |
|---|---|---|
| 10 to 25 yrs | 191 | 12.4 |
| 26 to 40 yrs | 495 | 32.1 |
| 41 to 55 yrs | 508 | 33.0 |
| 56 to 70 yrs | 270 | 17.5 |
| > 70 yrs | 76 | 4.9 |
| Total | 1540 | 100.0 |

**Table 3:** Distribution of the subjects based on gender

| Gender | Frequency | Percent |
|---|---|---|
| Females | 603 | 39.2 |
| Males | 937 | 60.8 |
| Total | 1540 | 100.0 |

**Table 4:** Distribution of the subjects based on clinical diagnosis

| Clinical Diagnosis | Frequency | Percent |
|---|---|---|
| Varicose veins | 89 | 5.8 |
| Anorectal complaints | 159 | 10.3 |
| Breast lump/mass | 79 | 5.1 |
| Diabetic foot | 92 | 6.0 |
| DVT | 11 | .7 |
| Foreign body | 8 | .5 |
| Hernias | 274 | 17.8 |
| Miscellaneous | 33 | 2.1 |
| Pain abdomen | 526 | 34.2 |
| PVD | 37 | 2.4 |
| Scrotal swelling | 24 | 1.6 |
| Swellings | 51 | 3.3 |

ISSN:0975 -3583,0976-2833 VOL 15, ISSUE 01, 2024

| | | |
|---|---|---|
| Thyroid swellings | 87 | 5.6 |
| Wounds and infections | 70 | 4.5 |
| Total | 1540 | 100.0 |

**Table 5:** Mean height (CM) of the subjects based on clinical diagnosis

| Clinical Diagnosis | N | Minimum | Maximum | Mean | S.D |
|---|---|---|---|---|---|
| Pain abdomen | 526 | 140.0 | 182.0 | 163.71 | 7.60 |
| Thyroid swellings | 87 | 145.0 | 172.0 | 158.55 | 6.04 |
| Breast lump/mass | 79 | 144.0 | 186.0 | 159.63 | 6.72 |
| Hernias | 274 | 140.0 | 180.0 | 163.24 | 7.74 |
| Varicose veins | 89 | 140.0 | 185.0 | 166.44 | 8.83 |
| PVD | 37 | 154.0 | 180.0 | 165.00 | 6.81 |
| DVT | 11 | 161.0 | 176.0 | 167.55 | 4.39 |
| Anorectal complaints | 159 | 147.0 | 180.0 | 165.23 | 7.95 |
| Diabetic foot | 92 | 150.0 | 180.0 | 164.58 | 6.09 |
| Wounds and infections | 70 | 149.0 | 178.0 | 163.04 | 5.92 |
| Swellings | 51 | 148.0 | 178.0 | 162.16 | 6.57 |
| Scrotal swelling | 24 | 152.0 | 185.0 | 164.04 | 7.64 |
| Miscellaneous | 33 | 150.0 | 180.0 | 164.42 | 7.73 |
| Foreign body | 8 | 158.0 | 175.0 | 165.63 | 6.28 |

**Table 6:** Mean Weight (KG) of the subjects based on clinical diagnosis

| Clinical Diagnosis | N | Minimum | Maximum | Mean | S.D |
|---|---|---|---|---|---|
| Pain abdomen | 526 | 30.0 | 96.0 | 65.58 | 10.09 |
| Thyroid swellings | 87 | 36.0 | 85.0 | 60.41 | 10.27 |
| Breast lump/mass | 79 | 45.0 | 95.0 | 63.25 | 10.12 |
| Hernias | 274 | 44.0 | 103.0 | 67.74 | 11.51 |
| Varicose veins | 89 | 40.0 | 120.0 | 68.91 | 13.70 |
| PVD | 37 | 48.0 | 86.0 | 65.04 | 10.46 |
| DVT | 11 | 53.0 | 155.0 | 73.55 | 30.02 |
| Anorectal complaints | 159 | 35.0 | 112.0 | 64.46 | 11.16 |
| Diabetic foot | 92 | 45.0 | 98.0 | 65.68 | 10.29 |
| Wounds and infections | 70 | 35.0 | 100.0 | 66.03 | 10.92 |
| Swellings | 51 | 39.0 | 98.0 | 66.50 | 11.76 |
| Scrotal swelling | 24 | 53.5 | 165.0 | 75.90 | 23.03 |
| Miscellaneous | 33 | 41.0 | 83.0 | 60.65 | 11.73 |
| Foreign body | 8 | 48.0 | 78.0 | 63.81 | 9.40 |

ISSN:0975 -3583,0976-2833 VOL 15, ISSUE 01, 2024

**Table 7:** Mean BMI of the subjects based on clinical diagnosis

| Clinical Diagnosis | N | Minimum | Maximum | Mean | S.D |
|---|---|---|---|---|---|
| Pain abdomen | 526 | 13.333 | 37.254 | 24.533 | 3.947 |
| Thyroid swellings | 87 | 14.793 | 33.248 | 24.029 | 3.894 |
| Breast lump/mass | 79 | 17.577 | 39.542 | 24.881 | 4.152 |
| Hernias | 274 | 16.359 | 40.057 | 25.506 | 4.576 |
| Varicose veins | 89 | 14.187 | 40.057 | 24.867 | 4.622 |
| PVD | 37 | 17.266 | 32.435 | 23.935 | 3.857 |
| DVT | 11 | 18.557 | 51.789 | 25.982 | 9.565 |
| Anorectal complaints | 159 | 12.856 | 41.139 | 23.632 | 4.039 |
| Diabetic foot | 92 | 15.756 | 43.556 | 24.343 | 4.275 |
| Wounds and infections | 70 | 14.568 | 35.431 | 24.830 | 3.855 |
| Swellings | 51 | 16.880 | 36.311 | 25.323 | 4.553 |
| Scrotal swelling | 24 | 18.955 | 62.872 | 28.421 | 9.322 |
| Miscellaneous | 33 | 14.041 | 32.831 | 22.437 | 4.134 |
| Foreign body | 8 | 16.806 | 30.469 | 23.386 | 4.138 |

**Table 8:** Association between clinical diagnosis and BMI

| Clinical Diagnosis | | BMI | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | Underweight | Normal | Overweight | Obese 1 | Obese 2 | Obese 3 | |
| Pain abdomen | Count | 21 | 286 | 172 | 43 | 4 | 0 | 526 |
| | N | 1.4% | 18.6% | 11.2% | 2.8% | .3% | 0.0% | 34.2% |
| Thyroid swellings | Count | 7 | 45 | 29 | 6 | 0 | 0 | 87 |
| | N | .5% | 2.9% | 1.9% | .4% | 0.0% | 0.0% | 5.6% |
| Breast lump/mass | Count | 4 | 38 | 30 | 4 | 3 | 0 | 79 |
| | N | .3% | 2.5% | 1.9% | .3% | .2% | 0.0% | 5.1% |
| Hernias | Count | 11 | 128 | 91 | 32 | 11 | 1 | 274 |
| | N | .7% | 8.3% | 5.9% | 2.1% | .7% | .1% | 17.8% |
| Varicose veins | Count | 3 | 49 | 27 | 7 | 2 | 1 | 89 |
| | N | .2% | 3.2% | 1.8% | .5% | .1% | .1% | 5.8% |
| PVD | Count | 1 | 24 | 8 | 4 | 0 | 0 | 37 |
| | N | .1% | 1.6% | .5% | .3% | 0.0% | 0.0% | 2.4% |
| DVT | Count | 0 | 7 | 2 | 1 | 0 | 1 | 11 |
| | N | 0.0% | .5% | .1% | .1% | 0.0% | .1% | .7% |
| Anorectal complaints | Count | 14 | 101 | 32 | 10 | 1 | 1 | 159 |
| | N | .9% | 6.6% | 2.1% | .6% | .1% | .1% | 10.3% |
| Diabetic foot | Count | 6 | 49 | 27 | 8 | 1 | 1 | 92 |
| | N | .4% | 3.2% | 1.8% | .5% | .1% | .1% | 6.0% |
| Wounds and infections | Count | 1 | 41 | 21 | 6 | 1 | 0 | 70 |
| | N | .1% | 2.7% | 1.4% | .4% | .1% | 0.0% | 4.5% |
| Swellings | Count | 4 | 25 | 14 | 6 | 2 | 0 | 51 |

ISSN:0975 -3583,0976-2833 VOL 15, ISSUE 01, 2024

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | N | .3% | 1.6% | .9% | .4% | .1% | 0.0% | 3.3% |
| Scrotal swelling | Count | 0 | 11 | 6 | 5 | 0 | 2 | 24 |
| | N | 0.0% | .7% | .4% | .3% | 0.0% | .1% | 1.6% |
| Miscellaneous | Count | 5 | 21 | 6 | 1 | 0 | 0 | 33 |
| | N | .3% | 1.4% | .4% | .1% | 0.0% | 0.0% | 2.1% |
| Foreign body | Count | 1 | 4 | 2 | 1 | 0 | 0 | 8 |
| | N | .1% | .3% | .1% | .1% | 0.0% | 0.0% | .5% |
| Total | Count | 78 | 829 | 467 | 134 | 25 | 7 | 1540 |
| | N | 5.1% | 53.8% | 30.3% | 8.7% | 1.6% | .5% | 100.0 % |
| Chi-square value-130.91 | | | | | | | | |
| p value- 0.001* | | | | | | | | |

*Significant

**Table 9:** Association between clinical diagnosis and height of the patient

| **Clinical Diagnosis** | | **Height** | | | | | | | | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **140 to 150** | **151 to 155** | **156 to 160** | **161 to 165** | **166 to 170** | **171 to 175** | **176 to 180** | **> 180** | |
| Pain abdomen | Count | 22 | 70 | 96 | 94 | 160 | 52 | 30 | 2 | 526 |
| | % | 1.4% | 4.5% | 6.2% | 6.1% | 10.4% | 3.4% | 1.9% | .1% | 34.2 % |
| Thyroid swellings | Count | 14 | 15 | 27 | 16 | 14 | 1 | 0 | 0 | 87 |
| | % | .9% | 1.0% | 1.8% | 1.0% | .9% | .1% | 0.0% | 0.0 % | 5.6% |
| Breast lump/mass | Count | 6 | 13 | 29 | 17 | 11 | 2 | 0 | 1 | 79 |
| | % | .4% | .8% | 1.9% | 1.1% | .7% | .1% | 0.0% | .1% | 5.1% |
| Hernias | Count | 15 | 36 | 44 | 55 | 92 | 17 | 15 | 0 | 274 |
| | % | 1.0% | 2.3% | 2.9% | 3.6% | 6.0% | 1.1% | 1.0% | 0.0 % | 17.8 % |
| Varicose veins | Count | 5 | 5 | 10 | 19 | 22 | 17 | 9 | 2 | 89 |
| | % | .3% | .3% | .6% | 1.2% | 1.4% | 1.1% | .6% | .1% | 5.8% |
| PVD | Count | 0 | 5 | 7 | 6 | 14 | 3 | 2 | 0 | 37 |
| | % | 0.0% | .3% | .5% | .4% | .9% | .2% | .1% | 0.0 % | 2.4% |
| DVT | Count | 0 | 0 | 0 | 4 | 5 | 1 | 1 | 0 | 11 |
| | % | 0.0% | 0.0% | 0.0% | .3% | .3% | .1% | .1% | 0.0 | .7% |

ISSN:0975 -3583,0976-2833 VOL 15, ISSUE 01, 2024

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | % | |
| Anorectal complaints | Count | 7 | 16 | 27 | 30 | 43 | 20 | 16 | 0 | 159 |
| | % | .5% | 1.0% | 1.8% | 1.9% | 2.8% | 1.3% | 1.0% | 0.0% | 10.3% |
| Diabetic foot | Count | 1 | 5 | 22 | 19 | 32 | 11 | 2 | 0 | 92 |
| | % | .1% | .3% | 1.4% | 1.2% | 2.1% | .7% | .1% | 0.0% | 6.0% |
| Wounds and infections | Count | 1 | 9 | 17 | 12 | 27 | 3 | 1 | 0 | 70 |
| | % | .1% | .6% | 1.1% | .8% | 1.8% | .2% | .1% | 0.0% | 4.5% |
| Swellings | Count | 2 | 9 | 11 | 12 | 13 | 3 | 1 | 0 | 51 |
| | % | .1% | .6% | .7% | .8% | .8% | .2% | .1% | 0.0% | 3.3% |
| Scrotal swelling | Count | 0 | 3 | 5 | 6 | 7 | 1 | 1 | 1 | 24 |
| | % | 0.0% | .2% | .3% | .4% | .5% | .1% | .1% | .1% | 1.6% |
| Miscellaneous | Count | 1 | 4 | 5 | 6 | 10 | 5 | 2 | 0 | 33 |
| | % | .1% | .3% | .3% | .4% | .6% | .3% | .1% | 0.0% | 2.1% |
| Foreign body | Count | 0 | 0 | 3 | 1 | 2 | 2 | 0 | 0 | 8 |
| | % | 0.0% | 0.0% | .2% | .1% | .1% | .1% | 0.0% | 0.0% | .5% |
| Total | Count | 74 | 190 | 303 | 297 | 452 | 138 | 80 | 6 | 1540 |
| | % | 4.8% | 12.3% | 19.7% | 19.3% | 29.4% | 9.0% | 5.2% | .4% | 100.0% |
| Chi-square value- 180.52 | | | | | | | | | | |
| p value- 0.001* | | | | | | | | | | |

**Table 10:** Association between clinical diagnosis and weight of the patient

| **Clinical Diagnosis** | | **Weight** | | | | | | | | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **101 to 110** | **40 to 50** | **51 to 60** | **61 to 70** | **71 to 80** | **81 to 90** | **91 to 100** | **> 110** | |
| Pain abdomen | Count | 0 | 37 | 124 | 212 | 115 | 35 | 3 | 0 | 526 |
| | % | 0.0% | 29.4% | 32.5% | 37.3% | 35.9% | 29.4% | 17.6% | 0.0% | 34.2% |
| Thyroid swellings | Count | 0 | 16 | 28 | 28 | 12 | 3 | 0 | 0 | 87 |
| | % | 0.0% | 12.7% | 7.3% | 4.9% | 3.8% | 2.5% | 0.0% | 0.0% | 5.6% |

ISSN:0975 -3583,0976-2833 VOL 15, ISSUE 01, 2024

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Breast lump/mass | Count | 0 | 6 | 29 | 27 | 12 | 4 | 1 | 0 | 79 |
| | % | 0.0% | 4.8% | 7.6% | 4.7% | 3.8% | 3.4% | 5.9% | 0.0% | 5.1% |
| Hernias | Count | 1 | 18 | 61 | 95 | 64 | 31 | 4 | 0 | 274 |
| | % | 25.0% | 14.3% | 16.0% | 16.7% | 20.0% | 26.1% | 23.5% | 0.0% | 17.8% |
| Varicose veins | Count | 1 | 7 | 19 | 22 | 27 | 8 | 4 | 1 | 89 |
| | % | 25.0% | 5.6% | 5.0% | 3.9% | 8.4% | 6.7% | 23.5% | 33.3% | 5.8% |
| PVD | Count | 0 | 2 | 13 | 12 | 4 | 6 | 0 | 0 | 37 |
| | % | 0.0% | 1.6% | 3.4% | 2.1% | 1.3% | 5.0% | 0.0% | 0.0% | 2.4% |
| DVT | Count | 0 | 0 | 4 | 4 | 0 | 1 | 1 | 1 | 11 |
| | % | 0.0% | 0.0% | 1.0% | .7% | 0.0% | .8% | 5.9% | 33.3% | .7% |
| Anorectal complaints | Count | 1 | 20 | 29 | 70 | 33 | 6 | 0 | 0 | 159 |
| | % | 25.0% | 15.9% | 7.6% | 12.3% | 10.3% | 5.0% | 0.0% | 0.0% | 10.3% |
| Diabetic foot | Count | 0 | 5 | 25 | 35 | 20 | 5 | 2 | 0 | 92 |
| | % | 0.0% | 4.0% | 6.5% | 6.2% | 6.3% | 4.2% | 11.8% | 0.0% | 6.0% |
| Wounds and infections | Count | 0 | 3 | 21 | 27 | 11 | 7 | 1 | 0 | 70 |
| | % | 0.0% | 2.4% | 5.5% | 4.7% | 3.4% | 5.9% | 5.9% | 0.0% | 4.5% |
| Swellings | Count | 0 | 4 | 12 | 17 | 13 | 4 | 1 | 0 | 51 |
| | % | 0.0% | 3.2% | 3.1% | 3.0% | 4.1% | 3.4% | 5.9% | 0.0% | 3.3% |
| Scrotal swelling | Count | 1 | 0 | 6 | 7 | 2 | 7 | 0 | 1 | 24 |
| | % | 25.0% | 0.0% | 1.6% | 1.2% | .6% | 5.9% | 0.0% | 33.3% | 1.6% |
| Miscellaneous | Count | 0 | 7 | 10 | 9 | 5 | 2 | 0 | 0 | 33 |
| | % | 0.0% | 5.6% | 2.6% | 1.6% | 1.6% | 1.7% | 0.0% | 0.0% | 2.1% |
| Foreign body | Count | 0 | 1 | 1 | 4 | 2 | 0 | 0 | 0 | 8 |
| | % | 0.0% | .8% | .3% | .7% | .6% | 0.0% | 0.0% | 0.0% | .5% |
| Total | Count | 4 | 126 | 382 | 569 | 320 | 119 | 17 | 3 | 1540 |
| | % | 100.0% | 100.0 % | 100.0 % | 100.0 % | 100.0 % | 100.0 % | 100.0% | 100.0 % | 100.0 % |
| Chi-square value-215.06 | | | | | | | | | | |
| p value- 0.001* | | | | | | | | | | |

*Significant

**Discussion**

The highest incidence of surgical conditions w.r.t weight is as given in the table below:

| Surgical condition | Common weight group |
|---|---|
| Pain abdomen | 61 -70kgs |
| Thyroid swellings | 41-50kgs |
| Breast lump/masses | 51-60kgs |
| Hernias | 81-90kgs |
| Varicose veins | 71-80kgs |
| PVD | 51-60kgs |
| Anorectal complaints | 61-70kgs |
| Diabetic foot | 61-70kgs |
| DVT | 51-60, 61-70kgs |

ISSN:0975 -3583,0976-2833 VOL 15, ISSUE 01, 2024

| | |
|---|---|
| Wounds and infections | 61-70kgs |
| swellings | 61-70kgs |
| Scrotal swellings | 61-70, 81-90kgs |
| Miscellaneous | 51-60kgs |
| Foreign body ingestion | 61-70kgs |

The highest incidence of surgical conditions w.r.t height is as given in the table below:

| Surgical condition | Common height group |
|---|---|
| Pain abdomen | 166-170 |
| Thyroid swellings | 156-160 |
| Breast lump/masses | 156-160 |
| Hernias | 166-170 |
| Varicose veins | 166-170 |
| PVD | 166-170 |
| Anorectal complaints | 166-170 |
| Diabetic foot | 166-170 |
| DVT | 166-170 |
| Wounds and infections | 166-170 |
| swellings | 166-170 |
| Scrotal swellings | 166-170 |
| Miscellaneous | 166-170 |
| Foreign body ingestion | 156-160 |

The common disease w.r.t BMI is as given below:

| **BMI group** | **Common surgical condition** |
|---|---|
| Under weight | Pain abdomen > anorectal complaints>hernias |
| Normal | Pain abdomen > hernias>anorectal complaints |
| overweight | Pain abdomen > hernias>anorectal complaints |
| Obese 1 | Pain abdomen > hernias>anorectal complaints |
| Obese 2 | Hernias> pain abdomen> breast lump/mass |
| Obese 3 | Scrotal swellings |

In this study, we found that hernias and varicose veins were more common with the patients with more weight. Obese patients more tend to have hernias than normal weight patients. Most patients with breast lumps belong to obese grade 2 class.

In developing countries like India, where there is a stage of nutritional transition particularly in urban areas, the problems of undernutrition and over-nutrition should be addressed.

ISSN:0975 -3583,0976-2833 VOL 15, ISSUE 01, 2024

**Conclusion**

We conclude that the most common surgical condition in all BMI groups were Pain abdomen followed by hernia and more hernias were associated with Grade 2 BMI. The effect of BMI plays a quintessential role in the pathophysiology of many surgical diseases

**References**

1. Popkin BM, Doak CM. The obesity epidemic is a worldwide phenomenon. Nutrition reviews. 1998 Apr 1;56(4):106-14.
2. WHO C. Obesity: preventing and managing the global epidemic. World Health Organ Tech Rep Ser. 2000 Jun 3;894(i-xii):1-253.
3. 3.Caballero B. A nutrition paradox-underweight and obesity in developing countries. N engl j med. 2005 Apr 14;352(15):1514-6.
4. 4.Dindo D, Muller MK, Weber M, Clavien PA. Obesity in general elective surgery. The Lancet. 2003 Jun 14;361(9374):2032-5.
5. Yeung TM, Cope AC, Whittome N, Lintott P. Raised BMI is an independent risk factor for groin surgical site infections in patients undergoing varicose vein surgery. American journal of infection control. 2008 Mar 1;36(2):152-3.
6. 6.Ali S, Mujahid MD, Javed A, Hussain MZ. Incidence of Paraumbilical Hernia in Patients with Increased BMI. Annals of Punjab Medical College (APMC). 2018;12(4).
7. Kibret AA, Oumer M, Moges AM. Prevalence and associated factors of hemorrhoids among adult patients visiting the surgical outpatient department in the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia. Plos one. 2021 Apr 20;16(4):e0249736.
8. Bouchoucha M, Fysekidis M, Julia C, Airinei G, Catheline JM, Cohen R, Benamouzig R. Body mass index association with functional gastrointestinal disorders: differences between genders. Results from a study in a tertiary center. Journal of gastroenterology. 2016 Apr;51(4):337-45.
9. Taguchi M, Kubo T, Yamamoto M, Muramatsu K, Yasunaga H, Horiguchi H, Fujimori K, Matsuda S, Fushimi K, Harada M. Body mass index influences the outcome of acute pancreatitis: an analysis based on the Japanese administrative database. Pancreas. 2014 Aug 1;43(6):863-6.
10. Sohn MW, Budiman-Mak E, Lee TA, Oh E, Stuck RM. Significant J-shaped association between body mass index (BMI) and diabetic foot ulcers. Diabetes/metabolism research and reviews. 2011 May;27(4):402-9.
11. Singh P, Pradeep Y. Correlation of BMI with Associated Comorbidity--A Cross Sectional Study at a Tertiary Care Centre. Journal of Evolution of Medical and Dental Sciences. 2020 Nov 23;9(47):3543-7.