The Study of Body Mass Index (BMI) and Outcome in Patients of Acute Myocardial Infarction

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Segments

- Introduction
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- Result
- Discussion
- Conclusion

Introduction

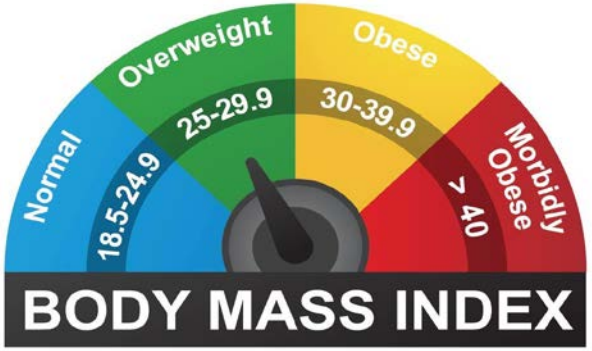
- Coronary heart disease (CHD) is a global health problem
- Obesity has been clearly established as an independent risk factor .
- Increased body weight has been associated with an increased risk of morbidity and mortality from coronary heart disease (CHD) [Wolk R et al. Body mass index: a risk factor for unstable angina and myocardial infarction in patients with angiographically confirmed coronary artery disease. Circulation 2003]
- There is also evidence that increased body mass index (BMI) is associated with increased overall mortality.[Kannel et al. Relation of body weight to development of coronary heart disease: Framingham study. Circulation;1967: 35: 734]

Introduction

- The type and severity of obesity may determine health risk, and provide a basis for selecting therapy.
- Screening for overweight and obesity may include measurement of body mass index (BMI), waist circumference, and weight to height ratio.

BMI

- The body mass index (BMI), or Quetelet index, is a proxy for human body fat based on an individual's weight and height.
- Body mass index is defined as the individual's body weight in Kg divided by the square of his or her height in meter.[Lee IM et al. Body weight and mortality: a 27-year follow-up of middle-aged men. JAMA 1993]



BMI

- BMI can be calculated quickly and without expensive equipment.
- The distinction between overweight and obesity is made on the basis of the body mass index (BMI).
- BMI = body weight (in kg) + height (in meters) squared

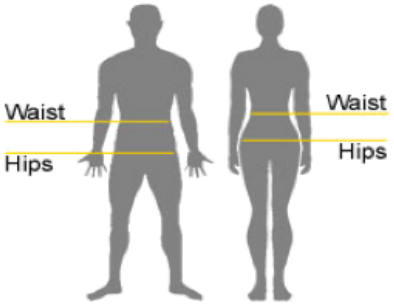
Classification of BMI- The recommended classifications for BMI adopted by the National Institute of Health (NIH) and World Health Organization (WHO)

- Underweight - BMI <18. 5 kg/m^2
- Normal weight - BMI 18.5 to 24.9 kg/m^2
- Overweight - BMI 25.0 to 29.9 kg/m^2
- Obesity – BMI >30 kg/m^2
- Obesity Class I - BMI of 30.0 to 34.9 kg/m^2
- Obesity Class II - BMI of 35.0 to 39.9 kg/m^2
- Obesity Class III- BMI ≥40 kg/m^2. (Severe, extreme, or morbid obesity)

Introduction Cont.

- BMI may overestimate the degree of obesity in individuals who are overweight but very muscular (for example, professional athletes or bodybuilders).
- There are other indirect measurement of adiposity. These include Waist to hip ratio (WHR), waist circumference and waist-to-height ratio (WHtR).

Measuring Waist Circumference



Measure the narrowest section of the torso, or at the mid point between the top of the hipbones and below the lowest palpable rib.

A Waist Measurement of
>102cm for males
>88 cm women

Is associated with an increased risk of Type 2 Diabetes and Cardiovascular Disease.

Introduction Cont.

- Interestingly, when BMI is taken waist is missed and when WHR is taken height is missed.
- Incorporation of both are often used-waist-to-height ratio (WHtR).
- Many investigators found BMI as an independent predictor and others found WHR as more significant

[SC Ho, YM Chen, JLF Woo et el Association between simple anthropometric indices and cardiovascular risk factors: International Journal of Obesity (2001) 25, 1689^1697]

Methods

- This was an observational study done at -

  Coronary care unit, Dhaka Medical College Hospital
- Our main objective was to see the effects of BMI on outcome of patients with acute Ml. We also wanted to see the relation of BMI with diabetes mellitus, hypertension and dyslipidaemia.

Inclusion criteria

- adult patients of acute Ml admitted in the Dhaka medical college Hospital irrespective of risk factors.
- Age: more than 18 years.
- Sex: both sexes.
- consent to participate in the study.

Exclusion criteria:

- Age less than 18 years
- Not giving consent.

ETHICAL ISSUES

- Reviewed and approved by The Ethical Review Committee of Dhaka Medical College.
- Written informed consent was obtained from relatives of all patients.
- Detail information was read out and explained in Bangla
- All aspects including confidentiality and right not to be participated was duly considered.

Results

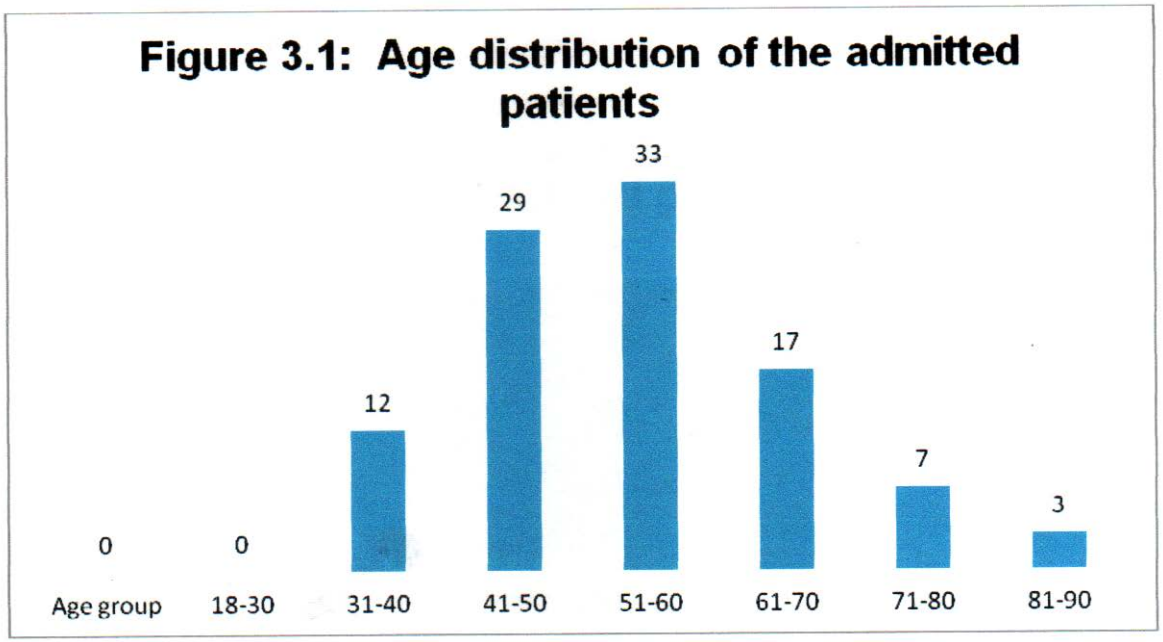
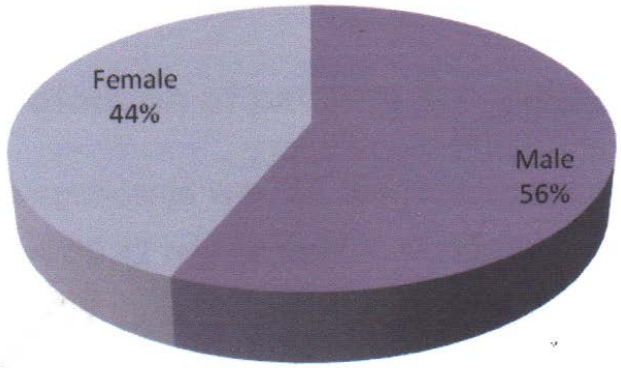


Figure 3.1: Age distribution of the admitted patients
0
0
12
29
33
17
7
3
Age group
18-30
31-40
41-50
51-60
61-70
71-80
81-90

Figure 3.2: Sex distribution of the admitted patients



Association of other risk factors with BMI ranges

BMI range	No. Patient	Associated HTN	Associated DM	Associated Dyslipidaemia
17-18.9	25	12 (48%)	6 (24%)	11(44%)
19-20.9	44	23 (52%)	25 (56.8%)	18 (41%)
21-22.9	18	10 (55.56%)	11 (61.1%)	10 (55.6%)
23-24.9	12	8 (66.7%)	9 (75%)	6 (50%)
25-29.9	2	1 (50%)	2(100%)	2 (100%)

Distribution of patients (n=101) according to BMI ranges

BMI	patients	Percentage
17-18.9	25	24.75%
19-20.9	44	43.56%
21-22.9	18	17.82%
23.24.9	12	11.88%
25-29.9	2	1.98%
>30	0	0

Outcome of patients (n=101) according to BMI ranges

BMI range	Improved	Died	Referred	DORB
17-18.9	22	1	1	1
19-20.9	34	8	2	
21-22.9	15	3		
23-24.9	9	1		2
25-29.9	1	1		

Results

- The mean BMI of improved male patients was 18.57 and the mean BMI of improved female patients was 18.89.
- On the otherhand BMI of those patients who developed complication and died are 21.3 in case of male and 21.95 in case of female respectively

Discussion

- This finding coincides with the finding of M Abu Sayeed et el They found that the rural people of Bangladesh who had Coronary Heart Disease have an average BMI 19.4 [M Abu Sayeed et al. Prevalence and risk factors for coronary disease in a rural population of Bangladesh .Ibrahim Med. Coll. J. 2010]
- Another study conducted in Sierra Leone shows 72% of their male respondent and 61% of the female respondent with CHD had BMI within normal range(18.5 to 24.0) [Prevalence of the common risk factors of Non Communicable Disease in Sierra Leone: STEPS report Sierra Leone :2009,34-47]

The Ongoing Debate

- A WHO expert consultation committee addressed the debate
- cut-off points for determining overweight and obesity in Asian populations is to be population-specific for BMI

[WHO consultation on Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies Lancet. 2004;363(9403):157]

Discussion

- The WHO expert consultation concluded that Asians generally have a higher percentage of body fat than white people of the same age, sex, and BMI.
- Also, their risk of developing type 2 diabetes and cardiovascular disease is substantial even below the existing WHO BMI cut-off point of 25 kg/m^2.
- The cut-off point for observed risk varies from 22 kg/m^2 to 25 kg/m^2 in different Asian populations

Discussion

- A big Chinese study shows underweight people were associated with a substantially increased risk of death as well as obese with high BMI in all Asian populations., however, was seen among East Asians but not among Indians and Bangladeshis. [Wei Zheng et al; Association between Body-Mass Index and Risk of Death in More Than 1 Million Asians; N Engl J Med 2011]

Discussion cont

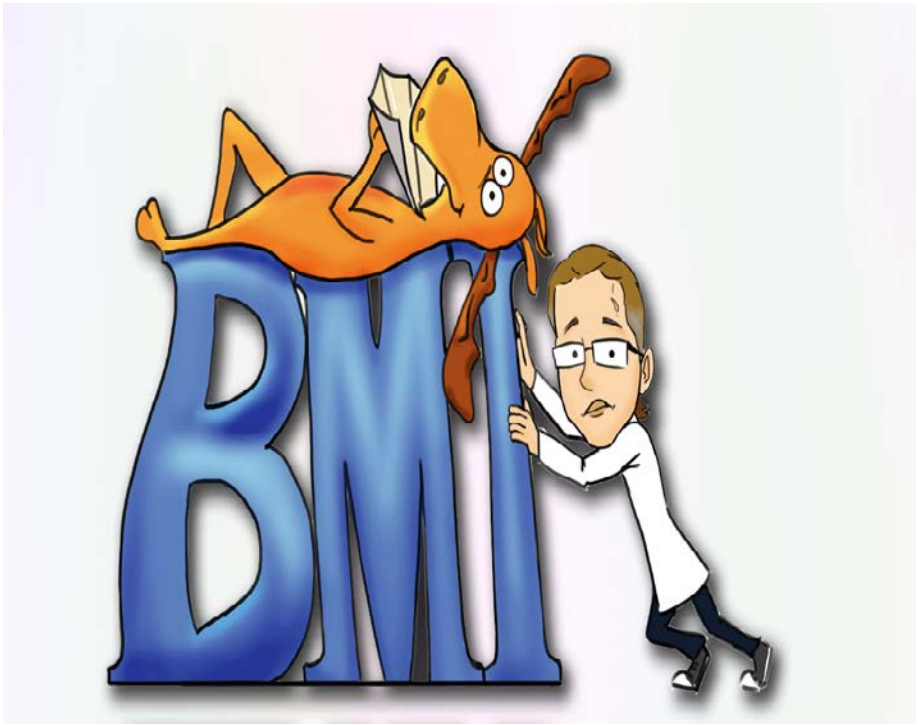
- In the of East Asians, including Chinese, Japanese, and Koreans, the lowest risk of death was seen among persons with a BMI in the range of 22.6 to 27.5. The risk was elevated among persons with BMI levels either higher or lower than that range
- An U-shaped association was seen between BMI and the risks of death

Conclusion

- The risk stratification on the basis of BMI in Bangladeshi population has to be adjusted
- Less morbidity and mortality in Healthy BMI
- Death and complications are more in both extremes.

Non-Communicable Disease Risk Factor Survey Bangladesh 2010

World Health Organization



Thank You