Original article

Relationship between Age and Serum Intact Parathyroid Hormone in Adult Obese Males

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Abstract :

Background: Obesity is a common health problem in urban population nowadays. Objective: The present study was carried out to asses the relationship of age with obesity in adult males. Methods: This cross sectional study was done in department of Physiology, Dhaka Medical College, Dhaka. For this purpose, 60 male subjects within the age range of 25 to 50 years were included in the study. Among them 30 non-obese, apparently healthy subjects were selected as control (Group A) and 30 obese subjects as case (Group B). Case and control subjects were selected from the Urban Primary Health Care Project (UPHCP), PA-2, Dhaka City Corporation, Dhaka and by personal contact during the period from January 2010 to December 2010. All the subjects were apparently healthy. Result: In this study, obese males showed significant negative correlation (p=0.032, r= -392) but non obese male showed non-significant (p=0.719, r= +0.069) positive correlation with age. Conclusion: This study concludes that, Serum iPTH level decreases with age in obese males.

Keywords- iPTH level, age, obesity.

Introduction :

With advancing age, osteoporosis is emerging as a major public health problem.[1] Neumerous studies have examined potential mechanisms of age related bone loss. Some suggests higher PTH (Parathyroid Hormone) level may be the reson for this in older adults.[2,3]

Globally, there are more than 1 billion overweight adults, at least 300 million of them are obese. It has reached an epidemic proportions.[6] As many as 30 health conditions are associated with obesity, including heart disease, diabetes, hypertension, stroke and some forms of cancer.[7]

Surprisingly, obese people have a higher PTH level than the non-obese.[4,5] However, higher level of PTH causes bone resorption and ultimately results in osteoporosis. Which is same as the higher PTH level in elderly people found in earlier studies.[2,3] It is needed to reveal whether the younger obese people are prone to develop higher PTH level as the elderly population. This can make them more prone to develop osteoporosis than the same aged non-obese people. Obesity being the predisposing factor for poor health and increased morbidity, might also be responsible for the development of osteoporosis at an earlier age. The relationship of age and PTH level in obese people is a question yet to be revealed.

Methods:

The present cross-sectional study was done in the Department of Physiology, Dhaka Medical College, Dhaka from January 2010 to December 2010. 60 male subjects were selected within the age range of 25-50 years. Among them 30 non-obese, apparently healthy subjects were selected as control (Group A) and 30 obese subjects as case (Group B).

Non-obese (BMI <30 Kg/m^2) and obese (BMI$\geq$30 Kg/m^2) male subjects were included. Persons suffering from Hypo/Hyperparathyroidism, chronic kidney disease, having history of Thyroidectomy & parathyroidectomy and oral calcium vitamin D & supplementation were excluded from the study. Sample was collected in fasting condition and anthropometric measurements were taken after evacuation of bowel and

bladder. Serum iPTH was measured by Chemiluminescent immunoassay method.

Statistical analysis was performed by using statistical package for social sciences (SPSS) for windows. Comparison between two groups were done by using Student's unpaired 't' test. Correlation analysis was done by using Pearson's correlation test. P value <0.05 was taken as level of significance.

Result:

Mean ± SD of age, different anthropometric and biochemical parameters are shown in table I.

Age

The results of age in different groups are shown in table-I, fig: 1.

The mean ± SD of age were 33.90±7.61 , 37.87±8.80 years in group A, B respectively.

There was non-significant difference between the groups. Therefore the groups were well matched for age.

Table-I

Mean (±SD) age (years) in obese & non-obese groups (n=60)

Groups	n	Mean±SD
A	30	33.90±7.61
B	30	37.87±8.80

Statistical analysis

Groups	t	df	P value
A_1 vs B_1	-1.867	58	0.067^{ns}

The results are expressed as Mean±SD. Unpaired Student's 't' test was performed to compare between groups. The test of significance was calculated and p values <0.05 was accepted as level of significance.

Group A_1 : Nonobese male   n = Number of subjects
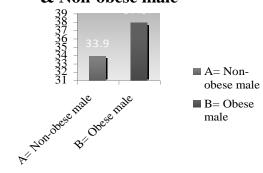
df = Degree of freedom

Group B_1 : Obese male   ns = Not significant

Table-II

Correlation between age and parathyroid hormone in obese & non-obese groups (n=60)

Groups	n	r value	P value
A	30	+0.069	0.719^{ns}
B	30	-0.392	0.032^{*}

Pearson correlation test was performed to compare relationship between parameters. The test of significance was calculated and p values <0.05 was accepted as level of significance.

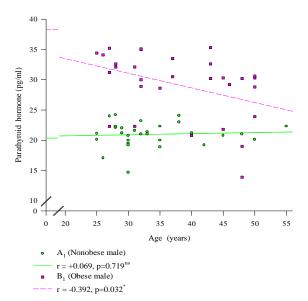## Figure-1: Mean age in obese & Non-obese male

Group A: Nonobese male   n = Number of subjects

ns = Not significant

Group B: Obese male   * = Significant at p<0.05 level

Figure 2: Correlation between age & parathyroid hormone in males

- A$_1$ (Nonobese male)
- — r = +0.069, p=0.719^{ns}
- B$_1$ (Obese male)
- - - - r = -0.392, p=0.032*

were same, from 25- 50 years. Both obese and non obese adult, apparently healthy males were selected. Non-significant difference between the mean values indicated that, well matched age group were selected as case and control.

In this study, There was significant negative correlation (p=0.032, r= -392) between age and iPTH level in obese males but non obese males showed non-significant (p=0.719, r= +0.069) positive correlation. On the other hand, a study found age related increase in PTH level among elderly people.[8]

In a study on post menopausal women, a positive relation of PTH with age have been found.[3] Similarly, Vieth et al (2003) found that, more than 70 years old people have consistently higher PTH level than adults younger than 50 years.[2]

However, present study revealed a negative correlation between serum iPTH and age as our study included a younger age group. From this study finding, it may be predicted that younger aged obese male have a negative correlation of PTH with age.

There is a direct relationship between age and serum parathyroid hormone (iPTH) in the normal population,[9] pathophysiologic basis of this age-related decline in serum iPTH levels in obese males remains unclear, although others have proposed that it is related to low dietary phosphorus intakes.[10] Some suggested age related decline in renal function may be the reason for this higher level of PTH.[11-15] One study suggested Age related rise in PTH is directly related to fall in creatinine clearance.[11]

Meanwhile, our study finding showing significant negative correlation between age and serum iPTH suggests that, younger obese males have higher iPTH level and might have a greater chance of developing osteoporosis.

Conclusion:

From the previous discussion it may be concluded that serum iPTH level decreases with age in adult obese males.

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