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A STUDY TO ASSESS THE ROLE OF FAMILY HISTORY IN PREDICTING ABDOMINAL ADIPOSITY.

Endocrinology

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ABSTRACT

Introduction.

In genetics, the family history is defined as the description of the genetic relationships and medical history of a family; when the family history is represented in diagram form using standard symbols and terms, it is referred to as a pedigree3.

The family history is the most important tool for diagnosis and risk assessment in medical genetics and promises to serve as critical element in the use of predictive genetic testing in primary care. Family history merits further investigation as a public health tool to identify persons with increased Heart Disease risk who might benefit from enhanced prevention strategies 4.

Objectives:

1. To ascertain supine abdominal height in individuals with family history of cardiovascular risk factors.
2. To assess the role of family history in predicting abdominal adiposity.

Methods:

The study was done on 223 subjects attending OPD or admitted to Victoria Hospital and Bowring& Lady Curzon Hospitals attached to Bangalore Medical College and Research Institute,Bangalore during the period of November 2015 to May 2017. Family History was elicited. Supine abdominal height was measured .

Results:

Among the subjects studied, 54.7% were Male and 45.3% were female. Of the subjects studied, 29.6% were in the age group of 21-30 and 25.1% were in the age group of 31-40. In this study,30% of the subjects had more than one relative suffering from either of the cardiovascular risk factors. 83% of these relatives were Diabetics, 32.5% were hypertensives,28.5% were both hypertensive and diabetic.2.2% had Ischemic Heart Disease and 1.8% had stroke. The history of father suffering from diabetes was the most elicited 42.6%

Conclusion:

The mean supine abdominal height was more in people with a combined history of Diabetes and Hypertension than in individuals with history of either Diabetes or Hypertension alone.

Large scale studies are required to validate the results.

KEYWORDS

Family History, Cardiovascular Risk Factors, Supine Abdominal Height

INTRODUCTION

The Indian subcontinent is caught at the crossroads of an epidemiological transition, as non- communicable diseases like Coronary Heart Disease and Type 2 Diabetes mellitus are fast replacing infections as the leading cause of morbidity and mortality[1].

Obesity is associated with a major prevalence of cardiovascular risk factors by affecting atherosclerosis through its impact on known risk factors for CAD such as dyslipidemia, hypertension, glucose intolerance, inflammatory markers, and the pro-thrombotic state as well as yet unrecognized features of the metabolic syndrome.With change in lifestyle and westernization of Indian Diet, Obesity is snowballing into an escalating epidemic.

There is a need to explore newer, inexpensive and easily obtainable anthropometric measures to clinically evaluate the relationship between visceral adiposity and cardiovascular risk factors.

A novel anthropometric index, Supine Abdominal Height is a useful tool in measuring the visceral adipose tissue clinically [2].It reflects Visceral Adipose Tissue(VAT) based on the fact that subcutaneous fat is displaced inferiorly by gravity in supine position.

The individuals were included in the study based on the presence of a family history of a first degree relative suffering from either of these.

Family History serves as a bridge from genetics to genomics in clinical practice. Because Family History is an independent risk factor for CVD, it has the potential to become a screening tool to identify people, especially asymptomatic young adults, who are at increased CVD risk[3].

MATERIALS AND METHODS

1. SOURCE OF DATA:

The study was conducted on 223 subjects attending Outpatient Departments or admitted to Victoria Hospital and Bowring & Lady Curzon hospitals affiliated to Bangalore Medical College & Research Institute, Bangalore.

A. Study design: Cross sectional study

B. Study period: From November 2015- May 2017

C. Inclusion criteria:

1. Patients willing to give written informed consent.
2. Age group: >18yrs
3. Patients who have a family history of a first degree relative suffering from either - Hypertension, Diabetes, Dyslipedemia or Ischemic Heart Disease

D. Exclusion criteria:

1. Patients who are a known* case of Diabetes, Hypertension or Ischemic Heart Disease
2. Spinal deformity
3. Pregnancy
4. Abdominal tumours, lump
5. Ascites
6. Pathological diseases (cancer, insufficient renal and hepatic performance, and chronic inflammatory pathologies)
7. Subjects in whom anthropometric measurements were not feasible

2. METHODOLOGY FOR DATA COLLECTION:

After obtaining clearance and approval from the Institutional Ethics Committee of Bangalore Medical College & Research Institute, adults with a family history of cardiovascular risk factors satisfying the inclusion criteria and exclusion criteria, attending Out Patient Departments and/or getting admitted to hospitals affiliated to Bangalore Medical College & Research Institute, during the period of November 2015 to May 2017 were taken up for the study after obtaining written informed consent.

"Supine abdominal height" was measured after a normal expiration to

nearest 0.1 cm in supine position with straight legs on a firm examination table, without clothes in the measurement area, at the level of iliac crest (L4-5) level with the help of a sliding beam caliper. Out of the two limbs of the caliper, the lower limb was slid underneath the back of the subject and the upper limb was brought down to slightly touch the abdomen at end expiration.Supine Abdominal Height was measured at the vertical distance between the two horizontal limbs of the caliper.

3.STATISTICAL METHODS

Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance.

In this study, Descriptive statistics such as mean and standard deviation (SD) for continuous variables, frequencies and percentages were calculated for categorical Variables were determined.

Comparison between males and females were analysed using Chi-Square test and unpaired t test respectively for categorical and continuous variables. SAD was divided into 4 quartiles and comparison in between quartiles was done using Kruskal- Wallis Test. Pearsons correlation coefficient was calculated between various quantitative Variables in the study. Bar charts and Pie charts were used for visual representation of the analysed data. Level of significance was set at 0.05.

Results

Age group/Gender distribution

Among the subjects studied, 122 (54.7%) were Male and 101 (45.3%) were female.Among the subjects included in the study, maximum number of males i.e 32.8% were in the age group of 21-30 and maximum number i.e. 28.7 % of females were in the age group of 31-40 years

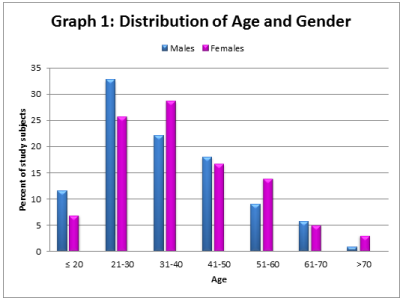
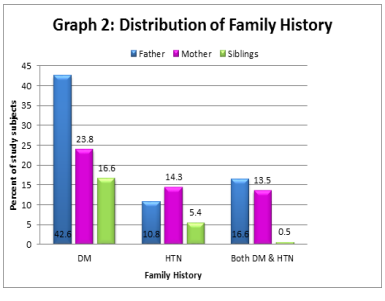


Table 1: Distribution of subjects according to the Family History (N = 223)

Family History	Father n (%)	Mother n (%)	Siblings n (%)	Total n (%)
DM	95 (42.6)	53 (23.8)	37 (16.6)	185 (83.0)
HTN	24 (10.8)	32 (14.3)	12 (5.4)	68 (30.5)
Both DM & HTN	37 (16.6)	30 (13.5)	1 (0.5)	68 (30.5)
IHD	3 (1.3)	0 (0.0)	2 (0.9)	5 (2.2)
Stroke	2 (0.9)	1 (0.5)	1 (0.5)	4 (1.8)
TOTAL	161 (72.2)	116 (52.0)	53 (23.8)	-

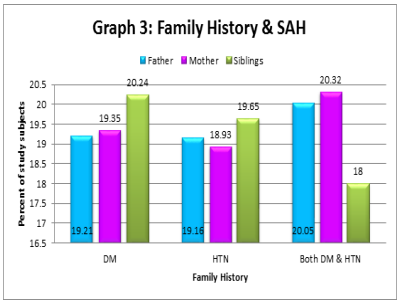


All the study subjects had atleast one first degree relative suffering from cardiovascular risk factors like Diabetes, Hypertension or Ischemic Heart Disease.

67(30%) of the subjects had more than one relative suffering from either of the cardiovascular risk factors.

In males, 16.5% had a paternal family history and 14.7% had a maternal family history of suffering from more than one CVD risk factor .In females,12.8 % had paternal and 9% had maternal family history of more than one risk factor.

185(83%) of them were Diabetics,70 (32.5%) were hypertensives, 66(28.5%) were both hypertensive and diabetic. 5 (2.2%)had Ischemic Heart Disease and 4(1.8%) had stroke. The history of father suffering from diabetes was the most elicited i.e. 95(42.6%)



The mean SAH was more in people with a combined history of DM and HTN than in individuals with history of either DM or HTN alone. However the values did not attain statistical significance.

DISCUSSION

The Human Genome Project[4], with its many advances has greatly heightened public awareness regarding the heritable basis of illness.

The epidemic of obesity is occurring on genetic backgrounds that have not changed, but it is nonetheless clear that genetics plays an important role in the development of obesity. These genetic defects can be divided into 2 groups: the rare genes that produce significant obesity, and a group of more common genes that underlie the propensity to develop obesity—the so-called "*susceptibility*" genes. Within a permissive environment, the more common genetic factors involved in obesity regulate the distribution of body fat, the metabolic rate and its response to exercise and diet, and the control of feeding and food preferences[5].

Genetic factors are major determinants of the familial aggregation observed in the amount of abdominal fat, irrespective of total body fat content, and that Abdominal Visceral Fat seems more influenced by genetic factors than abdominal subcutaneous adipose tissue. These findings imply that some individuals are more at risk than others to exhibit the various metabolic complications associated with upper-body obesity because of their inherited tendency to store abdominal fat in the visceral depot rather than in the subcutaneous depot[6].

Parental history has also been associated with novel markers of inflammation, lipoprotein(a) and fibrinogen, and measures of subclinical atherosclerosis. Familial aggregation of these risk factors suggests genetic influence on the causal pathways of familial cardiovascular risk.[7]

Retrospective studies have estimated the odds ratio (OR) of a lifetime cardiovascular event for an individual with a single first-degree relative (FDR) with a history of a cardiovascular event to be 1.1–2.63.The OR increases to 4.1 when the FDR has had a premature cardiovascular event, defined as a cardiovascular event before the age of 55[8].

The offspring of parents who suffer from premature coronary heart disease have a significantly higher risk of early cardiac death than controls. A genetic predisposition is compounded by a commonality of environmental risk factors within families[9].

Occurrence of parental CVD is an independent predictor of offspring cardiovascular events in middle-aged men and women. Premature CVD in at least 1 parent was associated with a significant doubling in cardiovascular risk for men and a 70% increase in risk for women over 8 years[10].

Supine abdominal height was first introduced in 1988, when Kvist and

it demonstrated a good correlation between visceral adipose tissue volume and SAH

It helps in including the often missed visceral obesity as when the patient lies supine the subcutaneous fat floats out and helps in easy assessment of the visceral adiposity.

So the study of Supine abdominal Height in individuals with a family history can serve as a clinically accessible tool to assess the risk of cardiovascular events.

CONCLUSION

- The mean Supine abdominal Height was more in people with a combined family history of Diabetes and Hypertension than in individuals with history of either Diabetes or Hypertension alone. Hence family history plays a very important role in predicting abdominal adiposity as witnessed by increase in supine abdominal height in normal individuals with a strong family history.
- Thus it can serve as an important tool in risk stratification.

Large scale studies are required to validate the results

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