Title: Risk of CAD in adolescents:

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Abstract:

Adolescence (10-19 years) is a period of transition from childhood to adulthood and involves rapid change in growth.

Childhood overweight and obesity is known to be associated with higher prevalence of other cardiovascular risk factors, including hypercholesterolemia, hypertension, and type II diabetes and subsequent cardiovascular disease later in life. In childhood, excess weight is associated with poor lifestyle, including sedentary habits, and lack of physical activity. Poor nutrition, such as low intake of fruits, vegetables, fibre and high consumption of energy dense foods, also may contribute to excess weight gain. Studies have shown that excess weight in childhood tracks in adulthood and may contribute to adult coronary artery disease (CAD). Physical activity and dietary habits acquired in childhood have been shown to exist in adulthood. Hence the researcher suggests that childhood and adolescent years may be prime periods for identifying those at risk for CAD.

An important step is identification of risk factors in early childhood to prevent problems in later life in adolescence. Therefore the study was conducted to identify the prevalence of risk factors of CAD in adolescent school going children in a selected community of Mumbai.

- Methods: A community based simple random sampling technique was used. A total of 750 samples were taken in the age group of 11-17 years from a selected community. A structured questionnaire was used to elicit the information on individual characteristics. Height and weights were measured and BMI was calculated. Overweight and obesity was assessed by body mass index (BMI) for age. Out of the 750 samples 62 per cent of them were males and 38 per cent were female. 26 per cent of them had a BMI 20-25m^2 which

was considered as overweight and , 24 per cent had a BMI of $>26m^2$ which was considered as obese .

10 per cent had borderline cholesterol levels of $>5mmol/l$.

(34%) subjects were identified in the risk group of which 39 per cent were identified as low risk, 32 per cent in moderate risk and 29 per cent in high risk to CAD.

Conclusion: Healthy adolescents can be healthy adults. Interventions in the form of life style modifications could play important role in preventing obesity and also can be primary prevention for risk to CAD (coronary artery disease).

Introduction:

Adolescence is a period of transition from childhood to adulthood. The World health organization (WHO) described obesity as one of today's most important public health problems and has designated obesity as Global epidemic/Adolescents constitutes 25% of the population in south East Asia regions India accounts for one fifth of the total populations. Adolescent obesity is increasing alarmingly due to changing life style, nuclear family, working parent's sedentary life style unhealthy eating habits and cultural transition. Adolescent's obesity is associated with increased incidence of hypertension, disturbance in sleep, insomnia, sleep apnoea, coronary artery disease, psychological disturbance, low self-esteem, type II diabetes, metabolic syndrome and increased morbidity and mortality of life. An important step is to reduce the risk to all this disease conditions by changing and modifying the life style. Hence the investigator decided to identify the prevalence and the factors leading to obesity in adolescent school children in selected schools of Mumbai.

Title of the study:

To identify the prevalence of risk factors of coronary artery disease (CAD) in adolescent school children in a selected schools of Mumbai.

Objectives:

- To find out the risk factors among the adolescent school children.
- To correlate risk factors with demographic variables.

Research Design

Phase I: Survey was used. In this study it will help the researcher to identify the risk factors present in the subjects, categorize the risk factor, understand their life style and the need for information required to control and prevent CAD

VARIABLES OF THE STUDY:

In this the research variable is identification of the prevalence of the risk factors among adolescents' school children regarding CAD.

POPULATION:

Population in this study refers to the school going adolescent children who are at risk of developing CAD.

SAMPLE:

In this study sample refers to the school going adolescent children in the age group of 11-18 years of the selected school

SAMPLE SIZE

750 school going adolescent children belonging to seventh, eighth and ninth standards were given the questionnaire to identify the risk factors.

CRITERIA FOR SAMPLE SELECTION

INCLUSION CRITERIA:

1. School going adolescent who want to participate in the study.
2. Parents who are willing to allow their subjects to participate in the study.

EXCLUSION CRITERIA

1. School going adolescent not willing to participate in the study.

SAMPLING TECHNIQUE

Purposive:

In Purposive or Judgemental sampling the researcher has knowledge about the population to select the sample members; here the researcher may decide purposefully to select people who are judged to be typical of that population.

TOOLS AND TECHNIQUES:

The following tools were used for this study:

Risk factor identification questionnaire for the subjects

The techniques used were self-reporting, and measurement.

Measurement techniques were used to check height, weight, BMI, laboratory values.

Validity:

Validity of the risk factor identification questionnaire was established by giving it to four medical consultants, 4 nursing experts, 1 physiotherapist, 1 dietician, 1 statistician and 1 language experts

Reliability:

Pilot Study:

In the pilot study was done on 75 subjects. Feasibility of risk factor questionnaire was tested. After obtaining the necessary permissions, the researcher selected the subjects from standard XI, explained the purpose of the study, obtained their consent, and administered the structured questionnaire. The total time required for the filling the questionnaire was 45 minutes. No change in the tool or technique was done.

Findings of the study:

Demographic data of subjects:

With regard to the demographic variables of the subjects with risk of CAD age varied between 11-17 years with a mean age of 12.5 years. Sixty two per cent of them were males and 33 per cent were female. Ninety four per cent of them were non vegetarian and only six

per cent were vegetarian, 45 per cent of the mothers of the subjects had completed secondary level of education, and 75 per cent of the mothers of the subjects were in service.

Prevalence of risk factors in subjects:

The important findings of the prevalence of risk factors of CAD in the subjects under the study were the following:

- 26 per cent of them had a BMI 20-25m^2 which was considered as overweight and , 24 per cent had a BMI of >26m^2 which was considered as obese .
- 10 per cent had borderline cholesterol levels of >5mmol/l.
- Among the subjects fourteen per cent had high waist hip ratio ranging from >1
- Three per cent had borderline blood pressure ranging from 120/90 to 130/80 mm Hg
- Sixty nine per cent of the subjects did not consume tea or coffee.
- Four per cent were exposed to passive smoking.

Presence of risk factors in significant others:

The important findings of the presence of risk factors in significant others of the subjects under the study were the following:
- Twenty five per cent of the significant others of the subjects had diabetes.
- 60 per cent of 1st degree relatives had history of high blood pressure and high cholesterol levels.
- Among the significant others 64 per cent of the second degree relatives had thyroid disorders.
- Seventy six per cent of the second degree relatives had renal impairment.
- CAD an independent risk factor was seen in 30 % of the significant others.

Distribution of subjects with regards to consumption of diet

Vegetables were consumed by 21 per cent daily and 77 per cent weekly.

Fruits were consumed by two per cent daily, 50 per cent weekly and 20 per cent did not consume it at all.

Forty nine per cent of the subjects consumed junk food in the form of kurkure, lays, wafers etc. daily and 46 per cent had it weekly.

Fast foods in the form of pav bhaji, samosa, wada pav, burgers were consumed by eight per cent daily and 71 per cent weekly.

Foods that are considered as risk for developing CAD were consumed at higher rates 46 per cent by the subjects in the form of junk food and fast food.

Vegetables and fruits which should be consumed on daily basis the overall percentage was very low 26 per cent only.

Distribution of subjects with regards to dietary pattern

Seventy five per cent of the subjects had breakfast daily and 25 per cent did not have. Regarding meals 56 per cent skipped meals and 44 per cent had it on time, this can be related to the facts that many consumed junk and fast food.

Sixty one per cent carried homemade food to school and 39 per cent had food from outside.

Oils which are considered good for heart were used less by family   i. e   rice bran one per cent; saffola and olive oil was nine per cent each respectively.

Oils   high in PUFA considered bad for heart i.e. coconut and sunflower oil was consumed by 38 per cent and 43 per cent each respectively.

More the oil consumption per month higher the risk of CAD, only six per cent consumed less than 3 litres/month, 54 per cent consumed 3-6 litres/month and 39 per cent consumed 6-9 litres/month.

Distribution of subjects with regards to sleep

83 per cent of the subjects could not sleep on time, 50 per cent of the subjects slept for less than eight hours and 75 per cent experienced disturbed sleep .Inadequate sleep is a precursor for CAD

Distribution of subjects with regards to the physical activity performed per week

The above data shows that maximum number of adolescent spend time in indoor activity of which most are sedentary activity this can be related to most of the parents both mother and father being working parents.

Computer games were played by 21 per cent for 28 hours a week.

Television was watched by 24 per cent for more than 28 hours per week.

Cricket and football though being very popular were played for fewer hours per week that is eight per cent and five per cent respectively for 28 hours per week.

Walking to school was done by only eight per cent of the subjects.

Distribution of subjects with regards to stress

Stress is important symptoms which can lead to CAD, cent per cent of the subjects experienced stress .During stress they experienced various symptoms, most experienced symptoms were anger (64 %),poor sleep (62%),nightmares (43%),headache (40%),crying(37%)

Factors which induce stress in subjects in home and   school environment: All the subjects experienced stress in both home and school environments. Sixty one per cent felt that the reason for stress in school was examination, 56 per cent assignment, 24 per cent peer competition and nine per cent tuitions.

In the home environment 61 per cent felt that high parental expectations, 22 per cent felt parental quarrel, 18 per cent thought sibling rivalry and five per cent felt alcoholic parents was the reason of their stress.

128 (50%) experience severe stress, 93(36%) had moderate stress and 34(13%) had mild stress. Hence it is important to counsel the subjects and schools should impart certain method of reducing stress levels in school children in the form of exercises, relaxation techniques and counselling.

Distribution of the subjects based on the number of risk factors of CAD

255(34%) subjects were identified in the risk group of which 39 per cent were identified as low risk, 32 per cent in moderate risk and 29 per cent in high risk to CAD.

Conclusion:

The study was done in a selected school in Mumbai. Adolescent are an important part of future world development. Inadequate physical activity, consumption of junk and fast foods, inadequate sleep pattern, stress, obesity and overweight are all strongly associated with risk

to CAD in adolescent. Interventions should be done in adolescence period as a primary prevention for risk of CAD. Life style interventions can play important role in prevention of the risk factors of CAD and having a healthy adulthood.