

Familial And Behavioral Determinants Of Obesity In Black Children, And Preventive Strategies

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Abstract

Obesity is the second leading cause of preventable premature death after tobacco, but we feel that it is in fact the number one, considering the spectrum of co-morbidities associated with it. In addition to genetic factors, cultural differences related to the nutritional habits, level of physical activity, and acceptance of surplus weight among African Americans play a major role in the development of obesity in this population. The growing pediatric epidemic of obesity should be given a serious consideration. Behaviors related to diet and physical activity are established early in the life, and modeled by family members. These habits extend in the adulthood. Therefore, early prevention efforts addressing children and other family members are critical to prevent obesity. The ideal obesity prevention program should focus on healthy diet and exercise curriculum, accompanied by active participation of parents or caretakers in these programs.

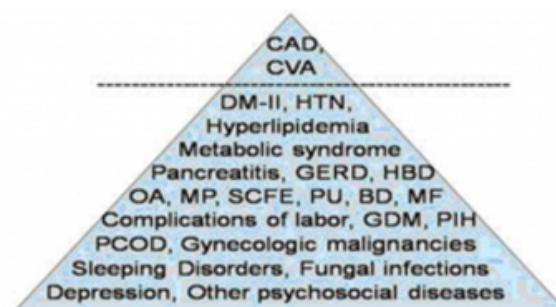
INTRODUCTION

Obesity is one of the fastest growing epidemics of the developed world, which is also spreading to the developing countries. Currently, in the United States, about 127 million adults are overweight, 60 million are obese, and 9 million are severely obese (1). Obesity increases risk for a variety of diseases. Hence, prevention of obesity is an essential responsibility of public health, not only because of its association with diseases, but also because of the economic implications and predisposition to co-morbidities.

Obesity is a very significant risk factor for Coronary Artery Disease (CAD), which can lead to myocardial infarction. Obesity is associated with hypertension, high triglycerides, and high LDL cholesterol levels, which indeed are major risk factors for the CAD and stroke. It also results in lowering of cardio-protective HDL levels. However, heart disease and stroke reflect only the tip of the iceberg (Figure 1).

Figure 1

Figure: 1 Obesity related disorders



Obesity related disorders – Tip of iceberg phenomenon

Obesity has a very strong association with the development of type II Diabetes Mellitus. It is also associated with the biliary diseases caused by gallstones. Obesity can precipitate, and worsen osteoarthritis (2). Obstructive sleep apnea is a well-known complication of obesity. Obesity is one of the proposed hypotheses in the causation of few psychiatric illnesses. It might cause sense of worthlessness, and lack of confidence, which can lead to major depression.

Obesity is the second leading cause of preventable premature death after tobacco (3), but we feel that it is in fact the number one, considering the spectrum of co-morbidities associated with it (as shown in Figure 1). According to American Heart Association (AHA), "Overweight children are more likely to become overweight adults." It is known

that the foundations of eating behavior and physical activity are developed early in childhood (4). Hence, if risk factors for obesity are controlled at this age, it may result in overall reduction of obesity in the adult population. We strongly believe that prevention of obesity in children is the most effective approach in controlling this epidemic, and merits very serious consideration.

INTENSITY OF THE PROBLEM

Unlike adults, children are classified into overweight and obese category based on their growth performance on a growth chart. Childhood overweight problem (BMI between 85th and 95th percentile on growth chart) and obesity (BMI more than 95th percentile) are among the fastest growing epidemics in the United States. Among children and teens aged 6 to 19, 16 percent i.e. over 9 millions are overweight. According to the Center for Disease Control and prevention (CDC), 'overweight' prevalence has almost doubled in children aged 6-11 years, and tripled among adolescents over the past two decades. Also, in addition to the 16 percent of children and teens aged 6 to 19 who are overweight, another 15 percent are considered at risk of becoming overweight (5).

Consequently, conditions such as type 2 Diabetes Mellitus, and high blood pressure, traditionally experienced by adults, have now become more common among children (6). Managing this increasing prevalence of overweight and obesity among children represents a national health priority.

National costs attributed to both overweight (BMI 25–29.9) and obesity (BMI greater than 30) is about 9.1 percent of total U.S. medical expenditures in 1998 and was around \$ 100 billion dollars in 2002 (7). This is approximately 10 % of the total health cost (8). This expenditure is on rise and would augment at a faster rate due to increasing prevalence of the obesity, and creation of more programs targeted at the prevention and treatment of this problem.

According to the National Health and Nutrition Examination Survey (NHANES) of 2003-2004, about 12 and a half million (17.1%) children and adolescents of age 2-19 are overweight and 66 million (32.2%) of adults are obese. The prevalence of being overweight was high in Mexican-American and non-Hispanic black girls compared to non Hispanic white girls. There was very little difference observed in obesity levels among men based on race or ethnicity (9).

From the above data that studied adult population, we

concluded that overweight and obesity occur at higher rate in African American population. Females are particularly affected more by this problem. Obesity affects black men and women across all socio-economic levels. However, African American female in low socio-economic group have greatest likelihood of being overweight or obese (10).

Hence, we tried to examine the factors that may be responsible for the increased risk of obesity in this population. We have also discussed some non-medicinal prevention options towards the end.

FACTORS TO BE CONSIDERED

There are a variety of reasons for the disparity of the obesogenic risk in black children. In addition to genetic factors, cultural differences related to the nutritional habits, level of physical activity, and acceptance of surplus weight among African Americans play a major role in the development of obesity in this population (10). Childhood obesity has multidimensional nature, and various socio-cultural factors appear to be influencing it. Sedentary life style is a major contributing factor to develop obesity.

Level of exercise in childhood, and exercise in Physical Education (PE) classes in school positively correlates with the physical activity level as an adult (11). Childhood obesity reflects high-risk dietetic and physical inactivity practices. Behaviors related to diet and physical activity are established early in the life, and modeled by family members. These habits extend in the adulthood. Therefore, early prevention efforts addressing children and other family members are critical to prevent obesity (4).

A study conducted by Beech et al. indicates that the African American girls whose parents were less acculturated had less body image discrepancy and weight concern. Such cultural influences may include a somewhat liberal attitude toward overweight and obesity, some positive attributes associated with large body size, less concern towards dieting to become slim, preference for high fat food, and unfavorable attitudes about the health benefits of exercise (12). Parental modeling of healthful dietary behavior is associated with low fat eating habits, and high fruit and vegetable intake (13).

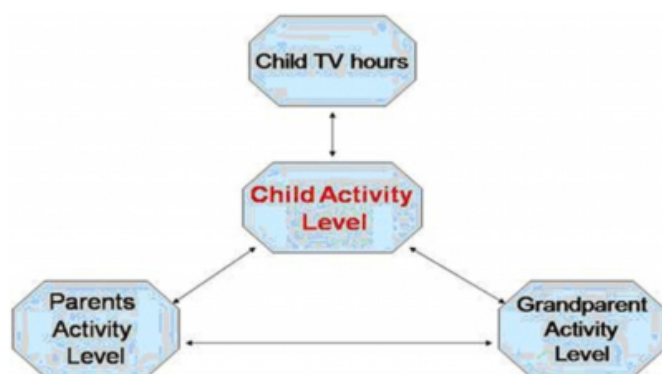
BMI of the African American girls is inversely related to their physical activity. Direct relationship was found between parent's self efficacy for supporting daughter to be active and the activity (14). This shows that parental or caregivers' attitude towards obesity and related factors has huge impact on child being overweight or obese. To create a

favorable environment for children to grow with normal weight, parents are the key elements and should always be taken into consideration while creating any obesity prevention or treatment program. A study that investigated the dynamics of African American families (₁₅) found that only 44 % of caregivers perceived their child's weight to be a potential health problem despite the fact that large number of the children (57%) were obese and super-obese (12%). The authors ascribed these findings to the cultural differences in the acceptance of a large body size, lack of knowledge and awareness about the future consequences of childhood obesity, and an optimistic bias in the perception of personal health risk. An optimistic bias occurs when one minimizes one's personal risks as compared to other people, but in fact he or she has the same level of risk.

Significant correlations were observed between children and parents for BMI, weekly television hours, and a trend for percent energy from fat. Correlations also existed between child television hours and parent activity level; child BMI and grand-parent BMI, and child television hours and grandparent activity level (₆). This again shows that many intra-familial factors are responsible to develop obesity in African American children, parents and grand-parents (Figure 2). In one of the focus group studies (₁₆), fathers expressed concern about toddler's picky eater developmental stage. They bribed their children out of frustration to make them eat. It is found that there is an adverse effect to the positive eating behavior by use of bribes i.e. positive reinforcement, which can lead to the development of childhood obesity in these children.

Figure 2

Figure 2: Intra-familial dynamics



In one of the study, it was observed that the maternal education level was positively correlated with the more adequate eating patterns amongst boys at home in Single-parent African American families. For low income African

American families, an adequate diet is difficult to achieve (₁₇). Mothers have an important role in preventing obesity in their children by shaping early diet and physical activity patterns.

A study conducted by Jain et al, it has been suggested that defining overweight or obese using growth charts has no meaning for some low income mothers. Despite differing perceptions between mothers and health professionals about the definition of overweight, both groups agree that children should be physically active and have healthy diets. Mothers believe that health professionals may be more effective in preventing childhood obesity by focusing on these goals, rather than on labeling children as overweight (₁₈). One of the focus group studies on a group of mothers is worth mentioning. Majority of the participating mothers wanted to provide good nutrition to their kids. So, they used to prepare foods of their child's likes, obliging specific requests from the child, and used bribes or rewards to achieve their feeding goals. They also used to encourage their child to eat more even after they said that they are full (₁₉). These issues definitely need to be addressed to prevent obesity. Maternal education is very important in any obesity prevention program to achieve long term goals.

It was found that maternal obesity was the single most important factor that predicts the development of childhood obesity. The standardized measures of home environment and household income were also found to be important predictors of obesity. The incidence of obesity after a six year follow up of 2913 children was observed to be high among children born to single mothers, black children, children of non working parents, children of non professional parents and children of mothers who did not complete high school (₂₀). This shows that children who are raised in high cognitive environments have low rates of becoming obese. Socio Economic Strata is known to be negatively associated with the health status of an individual. Frenn et al (₂₁) observed high prevalence of health problems related to diet and exercise behavior in low income families. Higher physical activity of girls was associated with total social support. Support for physical activity and low fat diet were greater as family income increased. The same study shows that living in a neighborhood with traditional Hispanic culture and foods appears to have ameliorated the harmful effects of lower income.

Surprisingly, in one of the study, Treuth et al (₂₂) found no significant differences in activity and fitness level in pre-

pubertal normal-weight girls with a family disposition to obesity such as having one or both obese parents. They attributed these findings to the parental concern about their kid becoming obese in adulthood like them. Therefore, obese parents may consciously engage their children in physical activity to prevent obesity. Another possible explanation is that the physical activity is enjoyable, accessible, and gratifying at this age. This can also lead to another question whether adolescent is a critical period when these things change, and a child tries to modify his or her behavior depending on the availability of resources. This again indicates that the obesity prevention programs should target early childhood to create and sustain healthy lifestyle.

WHAT CAN BE DONE?

Children have unique needs for growth and development, and hence weight loss programs need to consider the child's growth rate and prioritize their safety. Programs to prevent obesity should be tailored for differences by age, gender, and race. Preventing obesity in African American girls can reduce the occurrence of obesity by substantial amount because; this is the largest group at risk to develop obesity. Behavioral modifications and early preventive strategies are best suited for individual child at low cost and the effects are long lasting. Educating kids at early age and including their parents in any such kind of programs is the key. Pharmacotherapy and surgery should be the treatment of last resort.

In children, parental influence in modifying their children's behavior is important. Parents who exhibit healthy eating can positively affect their children's health. Strong social support of dietary intervention from family members involved in preparing food can predict a success of any community based obesity prevention program (23). Not only the prevention, but the recommended treatment for an overweight child to achieve a more optimum weight includes parental involvement and facilitating supportive family milieu in addition to limiting energy intake and increasing physical activity (24). Adult weight management techniques can be used for the pediatric age group to prevent and treat obesity. These strategies include motivational interviews, adjusting carbohydrate content in the diet, culturally apposite messages and materials, improving cultural competencies of health care providers and, using computer based techniques.

One study showed that sedentary caretakers facilitate more television viewing and thus, less physical activities. This same study indicates that the family centered obesity

prevention or treatment plans should be devised for the children and the adolescents (6). One study has shown that, interventions to enhance physical activity among preadolescent African-American girls may benefit from a parental module to sustain support and self-efficacy for daughters' physical activity (13). Obesity programs need to center on the dietary behaviors of parents. Significant weight reduction has been shown in the children after going through the behavior modification program with mother's involvement. The greater the number of sessions attended by mothers, the greater their daughters' weight losses (25). The same effect was magnified a bit when mother and daughter attended the same sessions of the obesity prevention programs. Therefore, author indicates designing clinical intervention that would help black adolescent girls and their parents understand the long term consequences of obesity and weight control. The findings further endorse that parental involvement in any such kind of programs is very useful. Strauss and Knight have found in their study that children raised in high cognitive environment have low rates of obesity, which further suggest that parental education about diet, exercise, and short and long consequences of obesity can decrease the prevalence of obesity (26). Frenn et al believe that a school based approach may be useful to build peer support for physical activity and lower dietary fat. Parish nurse or school settings may be most appropriate for building family role models and support (21).

Fitzgibbon M L et al (4) carried out an intensive 12-week randomized clinical controlled trial in 2002 to assess the effectiveness of an obesity prevention program on preschool children. The results of the study are still awaited as this is a 5 year study. Two groups received two different types of intervention i.e. either a 14-week dietary plus physical activity intervention or a general health intervention. Another similar kind of study conducted by Stolley et al (27) demonstrated substantial efficacy of a culturally specific 12 week family centered obesity prevention program focusing on embracing of low fat, low calorie diet and increased physical activity. After the intervention, significant effect was found in the group of mothers on saturated fat intake, daily cholesterol intake, and daily percentage of calories from fat. For daughters, considerable effect was found for saturated fat intake, dietary cholesterol intake, and percentage daily fat intake.

Health Improvement Program for Teens (HIP Teens) was a family based internet intervention program for obese black girls between ages 11-15 years (28). This study suggested that

family/parental variables pertaining to life and family satisfaction were the strongest mediators to exert a strong influence on weight loss efforts for these girls. Overall, the result showed that the Internet may be an effective alternative means of nutritional education program. Because parents can serve as both authority figures and role models in changing health behavior, parental involvement in any such kind of program will enhance its effect. Sometime, parental convenience and girls' food preference influenced dietary intake of these children. Obesity prevention programs need to capitalize on the parental motivation for their child's health and offer realistic strategies to assist healthful eating and physical activity (29).

CONCLUSION

In conclusion, we would like to mention that prevention of obesity would significantly reduce the burden of heart disease. This will help in cutting down the health care budget to a great extent. Insurance companies could be interested in sponsoring such kind of programs because it can potentially save them a lot of money in the future. By decreasing prevalence of obesity, not only the incidence of Heart disease will go down, but other obesity related conditions can be reduced to a greater extent. The growing pediatric epidemic of obesity should be given a serious consideration, and steps should be taken to prevent or treat it. The ideal obesity prevention program should focus on healthy diet and exercise curriculum, accompanied by active participation of parents of caretakers in these programs. Parental education plays a pivotal role to sustain the effects of such programs.

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