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An investigational study on the cutaneous manifestations of childhood obesity and overweight

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Abstract

Background and Objectives: When kids are overweight or obese, their skin has a lot of problems because their sebaceous glands don't work right and make too much sebum. They also have problems with collagen structure and function, the stability of their skin barrier, and their macro and microcirculation. The study's goal was to find out what skin problems overweight and fat kids usually have.

Materials and Methods: Between March 2019 and February 2020, the Department of Dermatology at Tagore Medical College in Chennai, Tamil Nadu, India, conducted this cross-sectional observational study. This study comprised eighty school-aged children who were overweight or obese, aged between six and sixteen years.

Results: There were 80 people in the hearing, 20 men and 60 women. The results were showed that boys were more likely to be overweight than girls. The average age of the people in our study was 14 years old. Young people (10–16 years old) were the most likely to experience it. Acanthosis nigricans was the most common skin problem we found in our study. In line with what other research has found, Acanthosis nigricans was the main result in ours.

Conclusion: According to this study, dermatologists and pediatricians don't fully understand how obesity affects the skin of school-age kids, even though early intervention might be possible.

Keywords: Childhood, paediatric, cutaneous, overweight, and obese

Introduction

Obesity in children is becoming an increasingly widespread problem that is a global nutritional concern. Obesity is defined as having a body mass index that is greater than the 95th percentile for children and adolescents of the same age and gender. Obesity, in contrast to being overweight, is associated with an increased risk of developing type 2 diabetes mellitus, insulin resistance, hypertension, liver and kidney illnesses [1-3], reproductive difficulties, and cardiovascular disease that manifests itself after the age of adolescence. It is possible for the disease to affect children of any age; however, it is more likely to arise in the presence of hormonal and genetic imbalances. This is the case given that other risk factors, such as bad eating habits and metabolic diseases, are not present [2-4].

According to the findings of an investigation conducted by Kahn in 1976, the prevalence of acanthosis nigricans for obese persons is much higher than average, reaching as high as 74%. The insulin resistance that these patients frequently exhibit is common. The American Diabetes Association issued a warning in the year 2000 that acanthosis nigricans is a recognized risk factor for pediatric diabetes [3-5]. Because of this, it is especially important for children to have this information provided to them. Several dermatological conditions, including striae, acanthosis nigricans, intertrigo, lymphedema, keratosis pilaris, acrochordons, plantar hyperkeratosis, adiposis dolorosa, hidradenitis suppurativa, psoriasis, and skin infections such as tinea cruris, folliculitis, candidiasis, furunculosis, and erythrasma have been documented in the literature as being associated with overweight and obese individuals [4-6].

There are several routes that relate metabolic syndrome and obesity to significant skin conditions that have a variety of causes. Both of these metabolic disorders are complex metabolic conditions. Among the organs that are most commonly impacted by metabolic abnormalities in obese individuals is the skin [5-7]. It is possible for dysfunctions in the skin barrier integrity, collagen architecture and functionality, sebaceous gland activity and sebum

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synthesis, sweat gland performance, lymphatic system, wound healing processes, micro and macrocirculation, and subcutaneous adipose tissue to be the cause of clinical manifestations of a wide variety of skin disorders, each of which has its own unique eteopathogenesis [6-8]. The purpose of this experiment was to determine the specific cutaneous symptoms that are present in children who are overweight or obese.

Materials and Methods

This cross-sectional observational study was carried out by the Department of Dermatology at Tagore Medical College in Chennai, Tamil Nadu, India, between the months of March 2019 and February 2020. Participating in this study were eighty children between the ages of six and sixteen who were either overweight or obese and were of school-going age.

Inclusion Criteria

- Pediatric patients with obesity
- Agreed to participate in the study

Exclusion Criteria:

- Patients with non-obesity
- Patients who do not agreed to participate

Results

The purpose and objective of this study was to identify the cutaneous manifestations that are present in children who are overweight or already obese.

Table 1: Age wise distribution

Sr. No.	Age distribution	Number	Percent
1.	6 to 09	28	35.00
2.	10–16	52	65.00
	Total	80	100.00

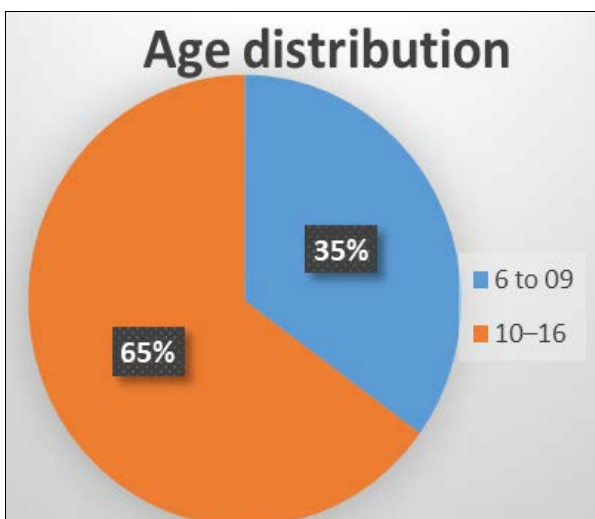


Fig 1: Age wise distribution

The greatest number of patients were those who were between the ages of 10 and 16 years old. In table 1, the age distribution is presented for your perusal. In the table, the age-wise distribution was stated as follows: patients aged 6 to 10 years old accounted for 35% of the total, while patients aged 11 to 16 years old accounted for the maximum of 65% of the total.

Table 2: Gender wise distribution

Sr. No.	Gender	Number	Percent
1.	Male	60	75.00
2.	Females	20	25.00
	Total	80	100.00

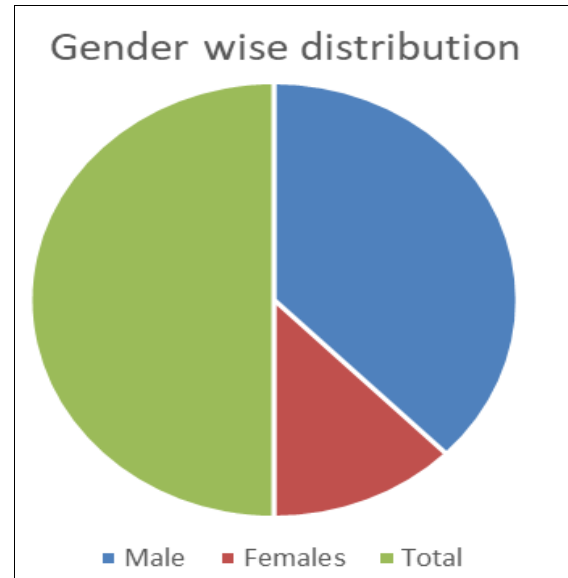


Fig 2: Gender wise distribution

A breakdown of the patients according to their gender is presented in table 2, which features the data. A total of seventy-five percent of the population was comprised of male candidates, while only twenty-five percent of the population was comprised of female candidates.

Table 3: The distribution of skin symptoms

Sr. No.	Cutaneous manifestations	Patients	Percentage
1	Seborrheic dermatitis	8	10.00
2	Striae distensae	12	15.00
3	Acne vulgaris	8	10.00
4	Acanthosis nigricans	11	13.75
5	Dermatophytosis	10	12.50
6	Atopic dermatitis	8	10.00
7	Intertrigo	3	03.75
8	Keratosis pilaris	20	25.00
9	Total	80	100.00

The majority of the cutaneous signs were present in the youngsters, with the most prominent ones being Striae distensae, Acanthosis nigricans, and Keratosis pilaris that were followed by others. All of the information is presented in table 3. One of the primary organs that is frequently impacted by metabolic disorders that are associated with obesity is the skin.

Discussion

In total, there were 80 patients that participated in the trial, with 60 males and 20 females. The findings were comparable to those obtained from studies conducted on obese children in which the number of male participants was greater than the number of female participants. According to our research, the average age was 14.0 years [7-9]. The individuals between the ages of 10 and 16 were found to have the highest average number of occurrences. During the course of our research, we discovered that acanthosis nigricans was the most common cutaneous symptom. Our

investigation primarily led to the identification of *Acanthosis nigricans*, which is consistent with the findings of past investigations [8-10]. In light of the fact that *acanthosis nigricans* was the most common consequence seen in children who were either overweight or obese, our research provided fresh evidence that further proved the association between the two. According to the findings of our research, the second most common dermatological symptom was called *striae distensae* [9-11]. *Striae* were the second most common cutaneous sign that was seen. Twenty percent of the children who participated in our research were found to have *acne vulgaris*, which is another prevalent indicator of obesity. The condition known as *acne vulgaris* is linked to both insulin resistance and hyperandrogenism, both of which are associated with extra fat [10-12].

The prevalence of this condition was high among a sizeable proportion of adults and adolescents who were either overweight or obese. As a result of the increased adipose tissue that is present in obese teens, moisture and maceration are encouraged, which ultimately results in an expansion of fungus and germs [11-13]. According to their research, just two children were identified with *furunculosis*, whereas 2.6% of patients were found to have *folliculitis* disease. The results of our research suggest that *dermatophytosis* is more common than bacterial infections, which is consistent with the findings of a study that was carried out on obese people. Furthermore, the presence of indications of atopic dermatitis and *seborrheic dermatitis* was shown to be more prevalent in persons who were overweight as opposed to individuals who were obese [12-14].

The presence of a substantial link between obesity and atopic dermatitis has been observed, with children over the age of two who have a higher body mass index (BMI) reporting more severe manifestations of the condition. It is possible that individuals who are obese are more likely to suffer from *seborrheic dermatitis*. This is because *seborrheic dermatitis* is linked to insulin resistance and hyperandrogenism, both of which are hallmarks of obesity. Atopic dermatitis, *seborrheic dermatitis*, and obesity were not shown to be associated with one another, according to the findings of additional research conducted on obese children and adolescents [13-15]. *Intertrigo* affected four percent of the pediatric population, according to our research. The presence of *intertrigo* has been observed in between 13.15 and 16 percent of obese youngsters, according to a number of further studies. Heat, humidity, and the accumulation of sweat all contribute to the irritation and maceration that occurs within the folds of the skin, which ultimately leads to *intertrigo*. Among the eighty children, *keratosis pilaris* was observed in four percent of them [14-16].

The condition known as *keratosis pilaris* has a significant relationship with obesity. *Acrochordons* were present in around 3.33 percent of the 80 children and adolescents. According to the findings of a study, this is the most common cutaneous manifestation of obesity in people who are obese [15-17]. In our research, we found that it was consistently widespread among people between the ages of 10 and 16. It has been found that the length of time an individual has been obese has a positive correlation with the incidence of *acrochordons*. There were 3.33 percent of the youngsters who displayed *hirsutism*, and all of them were considered to be overweight [16-18]. The findings were comparable to those of another study that examined 2.6% of

persons and found that they exhibited *hirsutism*. Within the scope of this particular investigation, *hidradenitis suppurativa* was detected in only two children. Nevertheless, any association between obesity and *hidradenitis suppurativa* has not been found in any of the further studies that have been conducted on obese children and adolescents [17-19]. *Cellulite* and obesity were both present in one of the children. Obese people have a higher incidence of *cellulite* than other people. The current research suggests that pediatricians and dermatologists do not appropriately examine and diagnose the numerous cutaneous symptoms of childhood obesity. This is due to the fact that the repercussions of this disease on the skin of school-aged children have not been sufficiently studied [20-23].

Conclusion

Despite this, a few more studies on overweight and fat kids and teens have not found any link between being overweight and *hidradenitis suppurativa*. *Cellulite* was seen on one overweight child. It's important to look closely at the different skin problems that come with being overweight or obese in kids, since dermatologists and nurses don't fully understand how being overweight or obese affects the skin of kids in school.

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None

Conflict of Interest

None

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