

THE GENESIS OF EXTREME OBESITY

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Abstract: *This paper are presenting the genesis of extreme obesity on the basis of a case report of a girl followed up longitudinally in three month intervals in the first year of life and then semi-annually until the age of 18 years. Control investigations were undertaken at the age of 19, 20, 21, 22, 36 and 46 years. The aim of the paper is to warn parents and children not to leave early overweight or just beginning obesity in the child uncontrolled, and to take in each such case immediate action towards combating it.*

Keywords: *Obesity; Longitudinal study; Individual report.*

Introduction

Obesity in early childhood is often underestimated as a risk factor not only by parents but sometimes also by pediatricians. It may later develop in a life-long burden for the given individual. We are presenting a case report of a girl followed up longitudinally from 1 month of age to 46 years of age (in three month intervals in the first year of life and then semi-annually until the age of 18 years). Control investigations were undertaken in the same subject at the age of 19, 20, 21, 22, 36 and 46 years. She developed an extreme obesity partly on a hereditary basis and partly due to overeating in connection with over care from the side of her grandmother. There were moments in the girl's development e.g. at the age of 6 or 9 years when there was a good chance for her to divert her path from obesity and to develop to normalcy, and thus be saved from her unfortunate faith – a severe obesity in her adult age leading to invalidity before her fifties. Such possible switch-points passed not recognized.

The aim of the paper is to warn parents and children not to leave early overweight or just beginning obesity in the child uncontrolled, and to take in each such case immediate action towards combating it.

Material and Methods

The Prague Longitudinal Study was founded by Vladimír Kapaín and the present senior author in 1956 on the lines of the International Children's Centre in Paris. The children represented a random sample of one Prague quarter of 100 thousand inhabitants. Only those children born on one day in the week (Wednesday) were included in the study (Kapalín et al. 1969). The children were added to the group stepwise for 4 years. The method used in anthropometry was that recommended by Falkner (1960) and Tanner (1969), resp. by Martin (1928). The study involved close to 300 children followed up by a pediatrician, anthropologist, psychologist and a social worker from birth to adulthood (Prokopec, Novotná and Havlínová, 1987) and lasted until 1982. About one third of the original number of children were investigated again when they were 35–39 and 45 to 49

years old. Meeting the former children who were investigated by the research staff in optimal cases more than forty times brought much joy and happiness to the research staff. The cases widely vary at present in their physical, psychological, social and health situations.

The authors introduce to the readers Mrs. Hannah who was born on January 2nd, 1957, in the family of a worker and an accountant as the second child, her brother being two years older. The father was at the time of birth of Hannah 32 and mother 27 years of age. The delivery took place in a renowned Prague delivery house in Londýnská Street and was normal. The weight of the newborn was 3015 grams.

Results

Preschool age

Hannah developed as a healthy and nice looking child (Figure 1). A light convergent strabismus developed after birth, the hip nuclei remained undeveloped even after five months. Caries developed in both lower molars at the age of two. Pedes plani and a valgosity of the lower extremities occurred at about the age of 3 years as well as slight, kyphoscoliosis at about the age of 5 years. The pediatrician of the research staff commented on her as being "slightly chubby".



Figure 1: Hannah at the age of 9 months.

School age

Due to her grandmother's intensive care Hannah developed in a great eater and started to put on weight and did not restrict herself to any degree. She was slow in movements. She enrolled in a course of swimming and gymnastics twice a week, but even this did not mean sufficient exercise. She was a tall girl. Her body height was 149 cm and weight 49 kg at the age of 10. Between 10 and 11 she put on over 9 kg of weight and added 5 cm in height. She had dry skin on her extremities, but sweated on palms and soles. Here and there she suffered headache, which disappeared after Aspirin. She suffered common cold and influenza each year several times and was cured by antibiotics. After the age of 12 Hannah spent two months in a hospital for obese children. She reduced her weight by 10 kg, but in the course of a rather short time she put it on again. She did not eat her lunches

at school (canteen) but ate at home. Her grandmother cooked her good and calorie-rich food. It seems that her grandmother in her good will to give Hannah the best possible, is the major factor contributing to Hannah's obesity (Figure 2).

Secondary sex characters developed at the age of 13 (mamma, pubes, axilla) and reached stage 1. Within a year they changed to stages 2. Menarche occurred in Hannah at the age of 13.9 years (late maturer). Height and height-weight proportions of Hannah plotted on the standard chart of Czech children after Prokopec and Roth from 1981 shows Figure 3: Classes of height are marked I–V and height-weight proportionality A–E. Hannah was tall. Between 6 and 13 she was in Class II, after the age of 14 she entered Class I in height. In body proportionality she developed in Class B (sturdy) and after 11 years of age she moved into class A (obese).

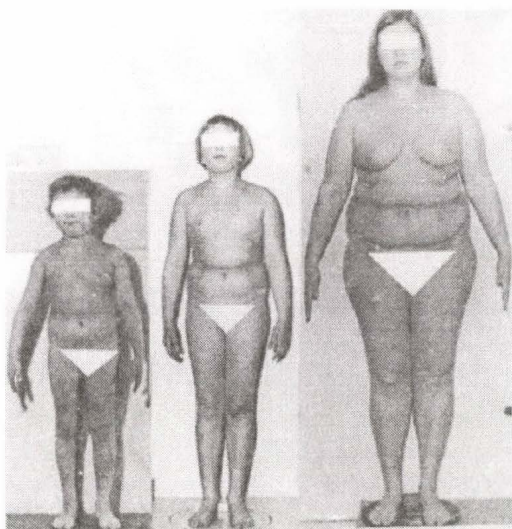


Figure 2: Hannah at the age of 6, 9 and 18 years of age.

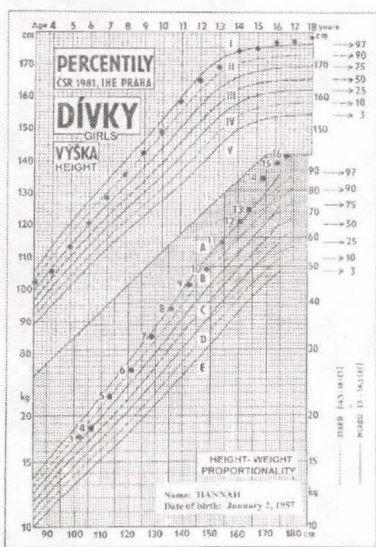


Figure 3: Heights and weights of Hannah plotted onto the Standard Chart of Czech children after Prokopec and Roth 1981.

Occupation

Though Hannah aspired to becoming a saleswoman, she entered an apprenticeship for becoming a cook. At the age of 15 and after, she suffered frequent attacks of bronchitis and influenza involving treatment with penicillin. She worked in a big restaurant partly in the kitchen, partly as a waitress. At the age of 18 striae developed in the waist area in Hannah. Bronchitis occurred several times in the year. She married at the age of 21, moved over to Pilsen where her husband worked as a bricklayer. They had two children. Her obesity increased after each child though she worked hard. Besides her occupation she cared about her family and about her parents in Prague (the distance from Pilsen to Prague being 80 km by train) bringing them food and clean laundry in heavy hand bags each week. She started to suffer varices in both her lower legs and pain in her back.

Mature age

Hannah visited our laboratory again at the age of 36. It was evident that her obesity reached the stage, which endangered her life and thus must be radically treated (Figure 4). Her weight was 148 kg, height 177 cm (lower than at the age of 18 and 22 years). Her BMI reached 47.2 units. Though the level of glucose (5.27) was in the norm as well as total cholesterol (4.92 – the cutting edge being 5.2 according to the WHO standard), Hannah had a high proportion of fat in the tissue, the atherogene Index was 8.4 and the waist-hip ratio exceeded the standard. Psychologists found her to be of higher irritability, sensitivity and frustration. Her vital capacity was 3500 cm³, systolic blood pressure 130 mmHg and diastolic blood pressure about 70 mmHg. The BMI of Hannah's mother is 31.1 and of her father 26.

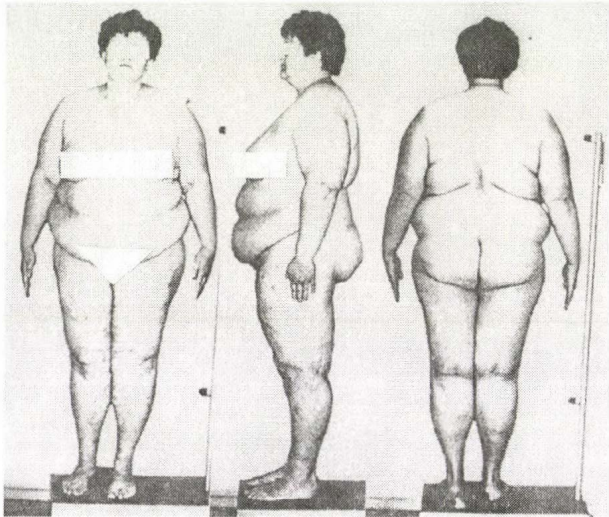


Figure 4: Hannah at the age of 36 years.

It was concluded, that Hannah accumulated risk factors of civilisation-linked diseases: Severe obesity, very high % of body fat, unfavourable waist/hip ratio, atherogene index 8.4, partly genetic load for obesity from the mother and insufficient physical activity. From the nutritional point of view it was found (based on the analysis of all food consumed during a period of three days – one of them being a weekend day) that Hannah consumes mainly proteins, and food of animal origin, more than adequate amount of kitchen salt but inadequate roughage fibre and vitamins. Recommendation as to amount and composition of food was given to her.

It was found that Hannah suffered gastritis chronica, hiat hernia, post ulcerous deformation of the duodenal bulbus, bilateral varicose complex and status post thrombophlebitis.

Status praesens

Hannah was investigated in our laboratory lastly in November 2004. She changed a lot, which was due to a loss of 40 kg since her last visit (Figure 5). Firstly, she underwent a surgical treatment of her extreme obesity and her stomach was banded, so that she

cannot eat at her will. Her weight dropped from 148 kg to 108.3 kg, and also her height lowered down (probably due to increased spine curvature). Her gall bladder was removed (contained 20 gall stones). She expects a surgery of the veins in both her legs soon. She suffers constant back pain. Before the surgical treatment of her obesity she was told that the back pain was due to her heavy weight. After the treatment she was said that the pain is due to weak muscles. She said that sometimes the pain in her spine is so severe that she is compelled to go in the middle of the night to the health centre for treatment. She applied for working disability.

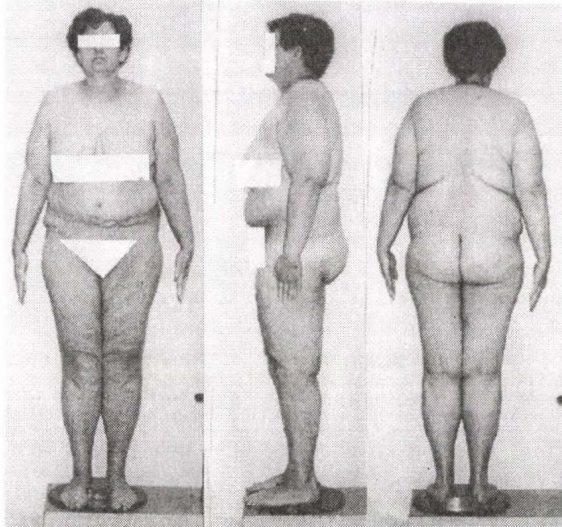


Figure 5: Hannah at the age of 46 years.

Discussion and conclusion

Not all child obesities from our longitudinal study developed to a pathological stage similar to that of Hannah. There are even cases, which (due to a strong will and regular exercise) got rid of their obesity. Others became obese at their adult age (Bellisle and Prokopec 1996). It seems that pediatricians in the staff of our team as well as those from Hannah's school and local health centre are more or less responsible for her obesity. There is no question about that one of the major factors of her obesity was her weak will to resist enormous food consumption and her insufficient output of energy through physical exercise.

There is a great number of ways at hand how to arrange for a healthy daily regimen of the child. These are based mainly on the balance between intake and output of energy in the child's body, on restriction of fat, sugar and salt in the diet and in a restriction of the amount of consumed food and in introducing adequate and regular physical exercise.

Concerning the anthropometry applied to obese children for control of the changes which take place in the body, the most recommendable measurements are: body weight in relation to stature, waist circumference (not necessarily in relation to height), upper arm circumference, thigh and calf circumferences and skinfolds. Skinfolds were always

measured in Hannah but in her higher age her skinfolds exceeded the capacity of the calliper.

The reader can follow the increase of height and body tissue in Hannah from the enclosed Table 1. The smallest BMI was in Hanna well below the age of 6 (BMI 16.2 at the age of 4.5 years), which is an indication of a tendency towards obesity at later age. Children with smallest BMI after the age of 6 or even 7 years are said to be "protected" against obesity at their teens. Table 2 shows the rise and fall of Hannah's weight and selected body measurements from the age of 18 to 46 years.

Table 1. Age, height, weight and BMI of Hannah from 1.5 to 18 years.

Age (years)	Height (cm)	Weight (kg)	BMI (kg/m ²)
1.5	81.7	11.3	17.0
2.0	87.3	13.5	17.7
2.5	92.0	14.8	17.5
3.0	100.2	17.1	17.0
3.5	102.8	17.7	16.7
4.0	105.4	18.3	16.4
4.5	109.3	19.4	16.2
5.0	113.0	22.4	17.5
5.5	117.5	24.4	17.7
6.0	121.4	26.7	18.1
6.5	124.9	29.7	19.3
7.0	128.5	32.7	19.8
7.5	131.9	35.6	20.5
8.0	135.3	38.5	21.0
8.5	138.6	39.8	20.7
9.0	142.8	44.7	21.9
9.5	145.1	46.1	21.9
10.0	148.7	49.0	22.2
10.5	151.0	52.0	22.8
11.0	153.8	58.3	24.6
11.5	156.5	62.3	25.4
12.0	160.3	66.4	25.8
12.5	161.7	69.3	26.5
13.0	163.7	71.0	26.5
13.5	166.5	77.5	28.0
14.0	169.2	86.0	30.0
14.5	172.5	91.9	30.8
15.0	174.8	95.1	31.1
15.5	175.9	96.8	31.3
16.0	176.9	99.0	31.6
16.5	177.3	99.8	31.7
17.0	177.4	106.4	33.8
17.5	178.4	100.3	31.5
18.0	178.5	114.8	36.0
19.0	178.5	105.1	33.0

Table 2. Selected body measurements of Hannah at 18, 36 and 46 years of age.

Age (years)	18	36	46
Weight (kg)	114.8	148.7	108.3
Height (cm)	178.5	177.0	175.7
Sitting height (cm)	91.5	90.0	85.0
Chest circumference (cm)	110.0	125.0	114.0
Waist circumference (cm)	105.0	132.0	119.0
Hip circumference (cm)	105.0	150.0	120.0
Upper arm circumference (cm)	38.5	48.0	39.8
Calf circumference (cm)	47.2	55.2	47.5
BMI (kg/m ²)	36.0	47.5	35.1

The authors hesitated whether they should include photographs or not. Finally, they decided that the pictures tell more about the child and adult physique than a page or two of text describing it. The reader can thus develop his or her own opinion about the problem under discussion. Let us stress that the main reason for publishing this case study was and is the warning to stop child obesity at its very early stage at any cost.

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