

The first stage in the dietary approach is to understand the child's way of life, physical activity level, the actual food habits and the level of food intakes as exactly as possible in terms of quality and quantity, meal by meal, snacks, candies, drank during day and night. The methodology of 24 h recall is applied during the consultation, completed by an FFQ, taking into account vitamins and minerals supplementations. This evaluation gives the opportunity to demonstrate possible 'over' consumptions as well as low intakes in some nutrients, inducing possibly specific nutritional deficiencies. The intakes are estimated as 'over' consumption or 'under' consumption by comparing with nutritional recommendations for the age, taking into account the physical activity level, and are not evaluated by comparing with dietary intakes of non-obese children of same age and sex.

As usually observed in the literature, energy intakes are frequently higher compared with recommended dietary allowances, taking into account a very low level of physical

activity. Among our patients, we observed an over consumption of proteins, fat, saturated fatty acids, sucrose and sodium. We also frequently observed very low intakes in some nutrients in spite of hyper caloric diet. High consumption of fruit juice or sodas to the detriment of milk causes calcium deficiency. Avoiding vegetables, fruits, high fibre breads and cereals induce very low fibre consumption. The frequent high-fat diet is mostly characterized by an over consumption of saturated fatty acids while insufficient intakes of poly-unsaturated fatty acids, inducing a poor fat balance. It is also frequently observed that the parents avoid giving vitamin D supplementation, considering that vitamins in general increase obesity. The plasma 25-hydroxyvitamin D is below the normal range in about 35% of our patients. Dietary habits and food intakes evaluation, including vitamins and minerals supplements, are necessary to elaborate feasible nutritional recommendations in order to correct over nutrition as well as nutrient deficiencies.

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Sleep loss and weight gain

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Epidemiology: Sleep disordered breathing (SDB) has a prevalence of 2% in the general paediatric population and is mostly caused by adenotonsillar hypertrophy. In children with obesity SDB is diagnosed in 13–59%.

Metabolic consequences: SDB in obese children is an independent risk factor for the metabolic syndrome. The severity of the sleep disorder is associated with the degree of metabolic deregulation. Possible links are systemic inflammation and oxidative stress. In SDB, increased concentrations of C-reactive protein and interleukin-6 and a decrease in interleukin-10 levels is observed. This inflammatory response is linked to the severity of SDB. Evidence for a role of oxidative stress is provided by an ongoing study of our group, showing higher uric acid concentrations, a parameter for oxidative stress,

in obese children with SDB. Both the increased inflammatory response and the elevated uric acid levels disappear when SDB is treated with Aden tonsillectomy or weight loss.

Future research: First of all, the mechanisms by which these metabolic consequences develop are still unclear. It is known that adipose tissue actively secretes adipokines. These molecules contribute to the pathogenesis of insulin resistance and other metabolic disorders. Therefore future studies focus on the effects of hypoxia on fat tissue and the excretion of such adipokines. Secondly, prospective studies are designed to evaluate the effects of the two therapeutic modalities for SDB in obese children: weight loss by diet plus physical activity and adenotonsillectomy.

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Psychological subtypes in obese children

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Aim: Children and adolescents who are overweight ($>\text{BMI}$ 85th percentile, which includes obesity) are a heterogeneous group and differ on dimensions measuring dietary restraint and psychopathology. In samples of clinical obese young adolescents we found that classifying children and adolescents based on psychological characteristics can be useful in making differential prognoses.

Method: The lecture will present two studies to research the validity of sub-typing young adolescents with overweight in both a non-clinical and a clinical sample.

Results: Using cluster analysis, results revealed three subtypes: a dietary restraint/internalizing group (DR + IN), a pure internalizing (IN) and a non-symptomatic (NS)

group. The DR + IN group outscored both other groups on measures of eating pathology, whereas the IN group outscored both other groups on measures of negative effect. Interestingly, the three groups did not differ on degree of overweight and the same findings were found in both samples.

Conclusions: The results seem to suggest that different psychological mechanisms can be observed in subgroups of young overweight adolescents and that diet management is not necessarily the only treatment goal for all of them.

Further research should explore whether individual psychological characteristics can be helpful when stipulating specific treatment guidelines for overweight children and adolescents.

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Which BMI standards to use in practice?

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Introduction: Defining obesity consists of choosing a suitable measure of body fat, and a suitable cut-off. In contrast to adulthood, there is still no general agreement about the definition of obesity in children. In adults, fatness is usually assessed using BMI and cut-off points to define grades of overweight have been based primarily on the association between BMI and mortality⁽¹⁾. Children grow in size, so that anthropometric cut-offs for fatness need to be adjusted for age. For this reason, grades of nutritional status usually refer to population distributions. Current definitions of childhood obesity: the first BMI charts were published in 1982 and updated in 1991^(2,3). In 1995, WHO recommended the references generated from data gathered in the NHANES I in the USA⁽¹⁾. In 2000, the US Centers for Disease Control (CDC) published sex-specific BMI-for-age growth charts⁽⁴⁾. The new WHO standards, released in 2006 for assessing the growth of children from birth to 5 years of age were created from samples made up of healthy breast-fed children from various countries around the world and were intended to present a 'standard' of physiological growth rather than a descriptive 'reference'⁽⁵⁾. In 2007, the WHO developed growth references for 5–19-year-olds based on the 1977 National Centre for Health Statistics (NCHS)/WHO data⁽⁶⁾. These charts were intended for both clinical use and epidemiological studies. Previously, in 2000, the International Obesity Task force (IOTF) developed BMI centiles constructed on the

basis of six nationally representative data sets to define childhood overweight and obesity⁽⁷⁾. The cut-offs for childhood overweight and obesity are smooth sex-specific BMI centiles, constructed to match the values of 25 and 30 kg/m², respectively, at 18 years. This definition was intended for international descriptive and comparative purposes only, and was not meant to replace national and international growth reference data for clinical use. Which BMI reference to use in practice? The IOTF definition, based on internationally representative populations, is widely used in epidemiological studies. Using IOTF then facilitate comparisons across studies and the assessment of time trends. Since the recent release of the new WHO standards and references, a growing number of studies use these definitions. It is worth noting that many recent studies present their data according to several definitions. For epidemiological studies, it is then recommended to present data according to IOTF, WHO and CDC definitions, in order to facilitate comparisons between studies in Europe and with US data. For clinical studies the WHO standards and references should be used, but national references can also be used in national contexts.

Conclusions: Various references of childhood obesity were published recently. Ideally the use of a common definition should facilitate comparisons between studies. Research allowing selecting the method, which is most suitable to define obesity is essential. They should be