

Editorial

Obesity – a risk factor or a disease. What can exercise do for obese children?

Obesity can be defined as excess body fat or adipose tissue. Obesity may be endogenous or exogenous in nature. Exogenous obesity arises from a sustained energy imbalance and a variety of other factors involved in its development: genetic, behavioural, cultural, environmental, and economic¹. Endogenous obesity is in some cases regarded as a risk factor and in others as a disease in itself. There is a growing body of evidence of the impact of obesity in many disorders, including cardiovascular disease, type-2 diabetes, osteoarthritis, and even some types of cancer². It is estimated that by 2015 approximately 2300 million adults will be overweight and more than 700 million obese, which has led the WHO to consider obesity as the epidemic of the 21st century³. With respect to children and teenagers, the prevalence of obesity has increased dramatically in recent decades to now reach 10 per cent of that population worldwide. This information is especially important when one considers that the probability of obese adolescents going on to become obese adults is 83 per cent⁴.

There are two major strategies to address this situation. One is to work to prevent children and teenagers becoming obese, and the other is to intervene so that those who are obese cease to be so. In the second case, one can intervene with pharmacological or non-pharmacological treatments. In the latter group, the most frequent types of intervention are surgical, dietary, psychological, and physical activity treatments. These can be carried out in isolation or in combination. Programmes based on physical activity and diet are the commonest, and are often used in combination. However, some studies have pointed to the real difficulty of implementing a low calorie diet and of the risks that it might involve in childhood⁵. It appears that adherence to the treatment is better if attention is focused on the intervention based on physical activity or

physical exercise. In this respect, the WHO specifically recommends that children aged between five and 17 yr should accumulate at least 60 min of daily moderate or vigorous physical activity, mainly aerobic. Also advisable is a minimum of three times a week doing activities that strengthen the musculoskeletal system⁶. However, the physical activity recommendations put out by the different international and national agencies and institutions do not appear to have been effective in reducing the prevalence of obesity. More effective than the simple practice of physical activity is the practice of physical exercise through structured, systematized programmes. In this regard, one might ask oneself some questions about the treatment of obesity based on physical exercise programmes: Are all exercise programmes suitable for children to stop being obese? Can they improve associated disorders such as hypertension or dyslipidaemia? Which features (content, duration, intensity, *etc.*) must the programme have? It is hard to answer these questions unequivocally since studies in this area have been very heterogeneous in both the sample studied and the treatment applied. It may be best, therefore, to get around this problem by considering studies that are systematic reviews or meta-analyses. Thus, for example, it has been shown that programmes for obese children based on aerobic exercise (not in combination with other content) with a duration of at least 12 wk and three weekly sessions longer than 60 min are effective in improving their aerobic component⁷. One must bear in mind that low fitness levels in obese children have been associated with the risk of cardiovascular disease. In this respect, low fitness levels in normal weight children have been found to be more harmful than adequate fitness levels in obese children. Hence, physical fitness can be considered to be a protector of health in the obese children. Moreover, the aerobic component (maximal oxygen consumption) can be taken as an indicator of the

limits of cardiovascular function. These programmes are equally effective in terms of considering obesity as a risk factor for diseases related to the lipid profile. In this case, if the aim is to reduce blood low density lipoprotein-cholesterol (LDL-C) and triglyceride levels, the exercise programme should be based on aerobic exercise at an intensity equal to or less than 75 per cent of maximum heart rate, with three weekly sessions lasting 60 min⁸. If, however, the aim is to increase the concentration of HDL-C, one should use combined programmes with an intensity greater than 75 per cent of maximum heart rate and session lengths longer than 60 min⁸. In contrast, if the aim is to intervene in obese children's hypertension, there are two types of programmes: to lower systolic blood pressure, the programmes should consist of three weekly sessions lasting longer than 60 min, and to lower diastolic blood pressure, these should be of somewhat less than 12 wk of more than three weekly sessions⁹.

At this point, it is necessary to respond clearly to a relevant question: What is meant by aerobic exercise? The obvious answer is that it is the exercise which mainly mobilizes the body's energy production by burning fats. However, the exercise programmes described in the published studies involve a wide range of activities: walking, running, swimming, sports (football, basketball, *etc.*), games with and without a ball, and working with machines, free weights, or a treadmill. One might even say that some of the activities proposed could even be detrimental for an obese child's health, a clear example being activities like jumping that impact on the joints. Since the researchers in a project must coordinate the physical exercise activities involved in the programme, their multidisciplinary expertise is essential. For instance, the research might include health personnel (doctors, nurses, physiotherapists, *etc.*), sports science professionals, and others (psychologists, *etc.*) who can bring their different perspectives to bear on the activities to be developed.

To summarize, regardless of whether one considers obesity to be a risk factor or a disease, it is imperative to intervene to reverse the current trend. In this sense, treatments based on physical activity, and especially on physical exercise programmes, have yielded promising results. Such programmes should, however, be prepared and implemented with clear and consistent guidelines to ensure the achievement of their objectives. By way of synthesis based on the scientific evidence, we

can put forward the following as general guidelines: (i) the programmes should be based on aerobic content, consciously avoiding any combination with other content such as strength or flexibility training; (ii) the duration of the sessions should be at least 60 min; and (iii) the frequency should be three sessions per week. Nonetheless, there is a clear need for more studies on such aspects as the duration of the programmes, their aerobic content, and, above all, the quantification of the exercise intensity¹⁰.

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