



# Obesity Epidemic: A Global Perspective



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**Submission:** 📅 August 22, 2018; **Published:** 📅 August 27, 2018

## Editorial

Excess weight, body-mass index (BMI), and obesity, have become global epidemics. According to the experts, if post-2000 trends continue, the probability of meeting the global obesity target is virtually zero [1]. Several recent studies have assessed the national, regional and global, prevalence of excess weight and obesity [2-10]. Influence of modifiable risk factors, such as blood pressure, serum cholesterol, fasting glucose, and body mass index on cardiovascular disease (CVD) is well established. Each metabolic risk factor is robustly related to the progress of CVD. Global estimates indicate, considerable potential for CVD reduction, with population-wide lowering of BMI [2]. A bilateral study, between the researchers at the Madras Diabetes Research Foundation (MDRF), and the staff at the University of Minnesota, found that compared to the US, the waist-weight ratio was significantly higher, in men and women from India [3]. These results support the hypothesis, that South Asians are particularly predisposed toward central adiposity. There is a great need to assess the role of BMI, waist circumference, and waist-to-hip ratios (WHR), to see if these parameters, singly or in combination, improve CVD risk prediction, so that ethnic-specific or region-specific guidelines, could be developed for prevention strategies [5]. Chinese researchers have reported, significant association with increased WHR, with a stronger association among women [11]. Global epidemics of metabolic diseases, if not controlled soon, could cause economic disaster in many countries. A recent (2018), National Health Service (NHS), UK model indicates, that NHS Health Check programme is contributing significantly, to the improvements in health and reducing healthcare inequalities. They predict that feasible changes in the organization of the programme, could result in more than 3-fold increase in health benefits [12]. In an earlier article in this journal, we articulated the management of excess weight and obesity [13]. In this article, we will discuss three possible interventions, which may reduce or reverse the metabolic risks, associated with excess weight and obesity.

Major national, regional, and global reports on obesity, have provided us an extensive analytical data, on the incidence and prevalence of excess weight and obesity worldwide. Despite the fact, these diseases pose a great global economic burden, these

reports have not come up with any easy solutions, to reduce or reverse the trend in the increase of these diseases. Excess weight and obesity are associated, with increased risk for the development of type-2 diabetes, and cardiovascular diseases. In view of these findings, there is a great interest in weight loss programs, that may alleviate this metabolic disease. It is hard to lose weight, but it is much harder to maintain the weight loss or sustain a healthy weight. A meta-analysis of 13 randomized trials suggested, that people on ketogenic diets, tend to lose more weight and keep more of it off, than people on low-fat diets. On the other hand, there are some reports, suggesting that ketogenic diet may predispose individuals to insulin resistance and diabetes. Professor Roy Taylor of Newcastle University, discussing the etiology of diabetes and reversibility, stated, that the first hint that type -2 diabetes is a fully reversible syndrome, came from bariatric surgery [14]. Based on his studies with low calorie diet, Roy Taylor reports, "Type-2 diabetes has long been regarded as inevitably progressive, requiring increasing number of oral hypoglycemic agents and eventually insulin, but is now certain, that the disease process can be halted with restoration of normal carbohydrate and fat metabolism. Type 2 diabetes can be understood as potentially reversible metabolic state precipitated by the single cause of chronic excess of intra organ fat". This hypothesis is worth further exploration, at the individual as well as population level.

Since we are discussing possible interventions, to reduce or reverse obesity related complications, we should consider the fact, that over 20 million children are born with low birth weight worldwide, and these children are "at risk" for developing metabolic diseases [15,16]. A study by the Harvard School of Public Health, has demonstrated that a multi-nutrient supplement for pregnant women, may alleviate this fetal origin of metabolic risk [17]. According to a Centers for Disease Control (CDC) and prevention report (June 2018), the prevalence of childhood obesity in the USA was 18.5% (14 million) and it also demonstrated a significant ethnic difference (Hispanic 25.8%, African Americans 22%). According to a WHO report, in 2010, 43 million children were overweight, and 98 million were at risk for overweight. This trend is estimated to double by 2020. According to Minnesota researchers even in

children, oxidative stress and adipokine levels worsen throughout the continuum of obesity. Kelly and associates in Minnesota, conducted a study to assess subclinical inflammation, fasting insulin, and endothelial dysfunction, before and after exercise in overweight children. These researchers demonstrated, that just eight weeks of moderate exercise, increased fitness, normalized endothelial function and lowered inflammation [18].

Obesity in general, is also characterized by chronic low- grade inflammation, with permanently increased oxidative stress [19]. Over expression of oxidative stress, damages cellular structures by generating excess superoxide, and lowers antioxidant mechanisms, leading to the development of obesity related clinical complications. Increased generation of superoxide in the vessel wall, lowers the production of nitric oxide, and creates an imbalance in the vasoactive compounds. This imbalance between the vasodilators and vasoconstrictors, will lead to the development of endothelial dysfunction, which we consider is the earliest sign of vascular disease. The transcription factor Nrf-2 (nuclear factor, erythroid-2-related factor-2, Nrf-2) for instance, is a master regulator of 500 genes (survival genes). Recent studies have demonstrated that induction of Nrf-2 and Ho-1 by Protandim (a mixture of five phytochemicals; Ashwagandha, Bacopa, Green tea, China Milk Thistle and Turmeric), is associated with a reduction of oxidative stress. Studies by Joe M McCord and associates, on the effect of Protandim on various pathways have shown, significant modulation, not only of pathways involving antioxidant enzymes, but also those related to Colon Cancer, Cardiovascular disease and Alzheimer's disease [20].

Excess of macronutrients in the adipose tissues, stimulates them to release inflammatory mediators, such as tumor necrosis factor alpha, interleukin-6, and C-reactive protein [21]. Persistent subclinical inflammation predisposes to chronic diseases. Hence, the inflammatory pathway, seems to be a potential target for interventions, to reduce clinical complications related to obesity and aging [22,23]. Data from observational studies, show lower inflammatory biomarker concentrations in those, who report performing frequent and more intense physical activity [18,22,23]. The mechanisms by which increased physical activity, reduces persistent inflammation is not well understood. Yet another approach for the management of chronic inflammation seems to be dietary. As natural modulators of proinflammatory gene expressions, phytochemicals from fruits, vegetables and legumes could be incorporated into novel complementary anti-inflammatory formulations. The phenolics and triterpenoids in fruits and vegetables have been shown to possess high anti-inflammatory activity [24].

It gives me great pleasure in writing this editorial, for the Journal of Interventions in Obesity and Diabetes. In an earlier overview, we briefly discussed some management strategies for these metabolic diseases. As we have mentioned earlier, when it comes to the management of Obesity, we seem to have very limited choices, bariatric surgery, diet, and exercise. In this editorial, we have discussed interventions at the earliest possible stages of

excess weight and obesity, even before birth and at early childhood. We also have discussed briefly two, early metabolic risks, oxidative stress and inflammation. We sincerely hope that the readers will consider these suggestions seriously and develop novel approaches to the management of these early metabolic risks.

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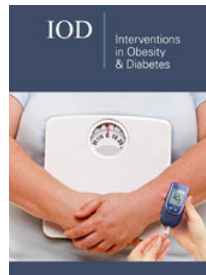
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