Abstract

Today with the increasing numbers in obesity amongst the adolescent population, the prevalence of metabolic syndrome has also been increasing. Metabolic syndrome, which is characterized by insulin resistance and inflammation, puts adolescents who acquire it at risk for developing cardiovascular disease and type 2 diabetes. Adolescents with metabolic syndrome often present with features such as obesity, hypertension, dyslipidemia, and abnormal glucose metabolism related to insulin resistance. Prevention of metabolic syndrome can be accomplished by implementing lifestyle modifications, diet modifications, behavioral interventions, assessing for environmental factors, and by screening for physiological risk factors.

Physiological Risk Factors

- Insulin Resistance, which causes inflammation, hyperglycemia, hypertriglyceridemia.
- Low HDL, it can contribute to having high cholesterol and higher LDL levels causing overall hyperlipidemia.
- Obesity, highly inheritable through shared genetics.
- Family history of atherosclerotic CVD is a well-known genetic risk for high lipid concentrations, high blood pressure, and high glucose concentration.
- Complications during infancy and childhood. The presence of maternal gestational diabetes in the adolescence’s childhood. Low birth weight, infant feeding practices, and early adiposity rebound are associated with later development of obesity.

Environmental Factors

- Ethnicity, Hispanic and black non-Hispanic children demonstrate higher rates of obesity than white non-Hispanic children across age categories (Magge et al., 2017).
- Air Pollution
- Low Socioeconomic Status. Adolescents who live in a low socioeconomic household may not have access to healthier food options.

Lifestyle Modifications

- It is recognized that inactivity can lead to lower insulin sensitivity in skeletal muscle and this can be reversed with increased physical activity (Al-Hamad & Raman, 2017). Weight reduction interventions such as diet modifications and increasing physical activity through exercise promotion reduce the risk of MS. Exercises should last 60 minutes per day and consist of aerobic, muscle strengthening, and bone strengthening exercises.
- Because disordered sleep length and quality affect appetite and decrease insulin sensitivity (Al-Hamad & Raman, 2017), it is important that patients adopt a healthy sleep pattern of about 8-11 hours of sleep per night.
- Smoking cessation in an effort to reduce risk of developing cardiovascular disease and metabolic syndrome. Exposure to tobacco has been linked to an increased risk of developing metabolic syndrome in the adolescent population. Intervention plan is needed which may include nonpharmacological and pharmacological treatments.
- Limiting screen time to < 2 hours per day.

Dietary Modifications

- Elimination of sugar sweetened beverages; decrease consumption of fast food; less added table sugar; avoidance of high fructose corn syrup; less high sodium processed food; and less saturated dietary fat in adolescents and children older than 2 years of age (Al-Hamad & Raman, 2017).
- Diet program which includes a lower intake of calories and a higher intake of vegetables, fruits and whole grains. The DASH diet (Dietary Approaches to Stop Hypertension) and Mediterranean diet are recommended as well.
- It is essential that dietary interventions and calorie reduction in children and adolescents are supervised by an experienced dietitian in growing children’s needs (Al-Hamad & Raman, 2017).

Behavioral Interventions

- Behavioral interventions are also known as behavioral weight-loss interventions (BWL). The primary goal of BWL is to modify energy-balance behaviors to improve weight status using behavior modification strategies (Wifley et al., 2018, p. 982).
- Although not traditional, cognitive strategies, such as self-monitoring for the identification of overeating triggers, problem-solving, and relapse prevention, are also commonly used (Wifley et al., 2018, p. 982).
- BWL is associated with improvements in cardiometabolic outcomes, such as BP, glucose, and lipids, in both children and adults, as well as improves diet, physical activity, sleep, quality of life and reduction in depressive symptoms (Wifley et al., 2018, p. 983).
- Behavioral incentives, a subset of operant conditioning, are used to reinforce the commitment to goals and to achieve desired behavioral change targets (Wifley et al., 2018, p. 983). It works on positive reinforcement; but rather than making food the incentive, if high-calorie foods are not kept easily accessible and require more work to obtain, then healthier choices that require less effort will become more reinforcing (Wifley et al., 2018, p. 984).

References