Health-Related Quality of Life, Depression, and Metabolic Parameters in Overweight Insulin-Resistant Adolescents

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ABSTRACT

Introduction: The purpose of this study was to examine the incidence and severity of depression and health-related quality of life (HRQoL) in youth with insulin resistance (IR) who are overweight/obese and to examine the impact on making lifestyle changes.

Method: New patients presenting for treatment in an IR clinic were screened for depression and HRQoL and reassessed twice during a 1-year treatment period. Metabolic and growth parameters were obtained for each participant.

Results: Elevated symptoms of depression were reported in 51% of the sample, and these symptoms were stable over time. Approximately 10% of these youth reported moderate or severe symptoms of depression. HRQoL scores indicated a good quality of life overall with slight improvement in some areas over time. Depression scores were not associated with demographic variables or metabolic parameters.

Discussion: More than 50% of adolescents with IR and obesity reported elevated symptoms of depression. These results provide sufficient evidence for the need to conduct routine screening of depression for all youth with IR so that appropriate mental health referrals can be made. J Pediatr Health Care. (2013) *27*, 120-126.

KEY WORDS

Depression, health-related quality of life, adolescents, obesity, insulin resistance, lifestyle changes

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Childhood obesity has become epidemic in the United States, with 31.7% of youth ages 2 to 19 years considered overweight (body mass index [BMI] between the 85th and 94th percentile for age and gender) or obese (BMI ≥ 95th percentile; Ogden, Carroll, Curin, Lamb, & Flegal, 2010). Children and adolescents who are overweight or obese are at a higher risk for development of concurrent conditions such as sleep apnea, orthopedic problems, hyperandrogenism, hyperinsulinism, and impaired glucose tolerance (Miller & Silverstein, 2006) and are predisposed for development of metabolic syndrome, which can lead to medical complications such as cardiac disease and type II diabetes (Cook, Weitzman, Auinger, Nguyen, & Dietz, 2003).

Metabolic syndrome is a well-documented phenomenon in adults and is becoming more commonplace in children. Metabolic syndrome in adults is defined by the National Cholesterol Education Program as a constellation of interrelated risk factors of metabolic origin that appear to directly promote the development of atherosclerotic cardiovascular disease (Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults, 2001). Weiss and colleagues (2004) found that the severity of obesity and the prevalence of metabolic syndrome in children were strongly associated and met National Cholesterol Education Program adult criteria for metabolic syndrome. Although a combination of at least three of the risk factors are needed for a diagnosis of metabolic syndrome in adults, some experts (Balkau, 1999) argue that insulin resistance (IR) is the key risk factor for a diagnosis of metabolic syndrome. IR has been defined by Mantzoros (2010) as "a subnormal response to both endogenous and exogenous insulin" and often includes a high serum insulin level with normal glucose levels in addition to clinical features including acanthosis nigricans, hyperandrogenism, accelerated linear growth, and rapid weight gain. Although a definition for metabolic syndrome in children hasn't been agreed upon, IR is showing increased incidence in children as obesity rates rapidly increase, putting youth at higher risk for type II diabetes and cardiovascular disease. This situation is of particular concern for medical professionals because the physiological aspects of IR, such as reactive hypoglycemia, can result in symptoms (e.g., increased appetite) that subsequently can cause increased food consumption and rapid weight gain. These symptoms result in further impairment of one's ability to make healthy lifestyle changes and possibly contribute to feelings of learned helplessness and depression.

It has been well documented that chronic medical conditions (e.g., cancer and diabetes) can affect a person's overall state of well-being and treatment successes (e.g., depression leading to nonadherence to treatment and a lack of motivation to change habits). Initial research with adults has linked metabolic syndrome with later symptoms of depression (Akbaraly et al., 2009; Pulkki-Raback et al., 2009) and altered health-related quality of life (Ford & Chaoang, 2008; Han et al., 2009). Research has shown that obese youth without IR who are pursuing weight management treatment have elevated rates of depression of 11% to 45% (Zeller & Modi, 2006; Zeller, Roehrig, Modi, Daniels, & Inge, 2006) that significantly exceed the rates of depression observed in the general population (e.g., point prevalence for depression in adolescence ranges from 4.6% in boys to 5.9% in girls [Costello, Erkanli, & Angold, 2006]). However, results from community-based samples have not been as consistent and indicate mild to no depression in obese youth (Erickson, Robinson, Heydel, & Killen, 2000; Sweeting, Wright, & Minnis, 2005). Youth seeking treatment for obesity consistently have shown significant impairment in health-related quality of life (Zeller & Modi, 2006; Zeller et al., 2006), with that impairment found to be up to 5.5 times greater than that of a healthy child, a finding similar to that of children diagnosed with cancer (Schwimmer, Burwinkle, & Varni, 2003). A pilot study by Melnyk and colleagues (2006) reported that overweight teens identified as having higher depressive symptoms also had less healthy lifestyle beliefs, indicating that depression may serve as a barrier to treatment success. It is possible that obese youth with IR may be at further risk for psychosocial difficulties given the effects of elevated insulin rates on the body, difficulties making healthy lifestyle changes, and fast-approaching medical comorbidities or complications of IR.

Intensive programs aimed at changing habits and decreasing rates of obesity have shown limited success as rates of obesity continue to climb. With increased rates of IR in youth who are obese and the potential to develop metabolic syndrome and associated health consequences, it is imperative to understand and address factors that may be barriers to making healthy lifestyle changes. The aim of this study was to examine the following questions: (a) What is the incidence of depression and the reported health-related quality of life (HRQoL) in adolescents with IR who are overweight/obese? (b) How do depression, HRQoL, and metabolic parameters change over time with lifestyle interventions and/or psychological support?

METHOD

Institutional Review Board approval was obtained at The Children's Mercy Hospitals and Clinics before implementing this research study. To participate in the study, youth needed to be between the ages 11 and 17 years; they had to be presenting for an initial visit to the clinic for treatment of IR; and both the youth and his/her parent needed to provide assent/consent to participate. Youth who met the initial inclusion criteria were further evaluated and then excluded from the study if they had prior mental health diagnoses and/or treatment, current treatment with metformin for IR,