CASE

A 62-year-old female underwent RYGB for obesity and had an uneventful immediate postoperative course. She returned for follow-up 6 months later complaining of severe, recurrent vomiting along with lower extremity weakness, paresthesia, dizziness and ataxia. She reported sharp pain and numbness over bilateral anterior thighs. Medication review revealed an OTC multivitamin patch that she was taking to correct any vitamin deficiencies. Her BP was 101/62 mm Hg, HR was 60 bpm, BMI was 26.41, examination of heart, lungs and abdomen were normal. Neurological examination showed decreased sensation to touch on both feet, legs and 4/5 muscle strength on bilateral lower extremities. Laboratory examinations showed normal CBC, normal liver function, serum zinc 55 mcg/dL (ref 56-134), copper 115 mcg/dL (ref 72-166), vitamin B1 38.1 nmol/L (ref 66.5 – 200), vitamin B12 323 pg/mL (232-1245 pg/mL), 25-hydroxyvitamin-D 29 ng/mL (30-100 ng/mL). Cervical and thoracic MRI imaging were normal. After stopping the vitamin patch, she was treated with intravenous thiamine followed by 100 mg oral thiamine TID along with 1000 mcg oral cyanocobalamin once daily. She experienced complete recovery of her symptoms in 6 weeks.

CONCLUSION

Our patient relied on an OTC multivitamin patch which proved to be ineffective since it only contained 1 mg and the usual recommended dose is 50-100 mg orally daily. Symptoms will usually resolve with proper treatment. It is essential to pay attention to the nutritional status of post-bariatric surgery patients.

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A HIGH-FAT, HIGH-SUGAR DIET INDUCES INSULIN-LIKE GROWTH FACTOR 2 HYPER-METHYLATION IN MALE WISTAR RATS

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OBJECTIVE

The prevalence of obesity and insulin resistance (IR) has increased at an exponential rate worldwide. Although several mechanisms such as dysregulation of the epigenome have been implicated, the disease pathophysiology remains to be fully elucidated. The primary objective of this study was to elucidate DNA methylation profiles and gene regulatory networks that are altered in the skeletal muscle (SM) during the development of obesity and IR in male Wistar rats.

METHODOLOGY

Male Wistar rats (n=20) were fed either a high-fat, high-sugar (HFHS) or a standard diet (STD) for 12 weeks. SM was harvested for histology, gene expression measured using RT2 Profiler™ PCR arrays and Taqman® assays and global and gene-specific DNA methylation were quantified using pyrosequencing.

RESULTS

Rats in the HFHS group gained more weight (567.5 ± 8.8 vs 474.0 ± 10.5 g, $p<0.0001$) and had increased insulin concentrations (6.1 ± 0.9 vs 3.8± 0.6 ng/ml, $p<0.05$) compared to the STD-fed rats, while no histological differences were noted. Increased expression of Insulin-like growth factor 2 (IGF2) was associated with HFHS diet exposure. Whilst no global DNA methylation changes were observed, we identified hypermethylation of an intronic CpG site within IGF2 ($p<0.01$). In silico analysis identified binding sites for transcription factors CCCTC-binding factor (CTCF), myogenin and myoblast determination protein 1 (MYOD) within close proximity to the hypermethylated CpG.

CONCLUSION

This study provides information about dysregulated DNA methylation and gene expression signatures during the progression of obesity and IR in SM.