Effect of sleeve gastrectomy in two Arab children with melanocortin-4 receptor mutation

[1]Lessan N, [1]Hameed N, [2]Farooqi S, [1]Barakat M.

[1]Imperial College London Diabetes Centre (ICLDC)

[2]University of Cambridge Medical Research Laboratories, Institute of Metabolic Science

Melanocortin 4 (MC4) receptor mutations are the commonest of the monogenic forms of obesity. We report the response to bariatric surgery for morbid obesity in a twelve year old Arab Emarati boy and his fourteen year old sister who were later found to have an MC4 receptor mutation.

Parents were unrelated and both had been diagnosed with type 2 diabetes mellitus. There was history of early onset obesity. Both children had diabetes mellitus. There was generalized obesity and acanthosis nigricans but no dysmorphic features. Investigations including urea & electrolytes, thyroid and liver function tests were normal. GAD & IA2 antibodies were negative.

A previously planned sleeve gastrectomy was performed a week after assessment at ICLDC. Within a few weeks of surgery major improvements in obesity and diabetes control were evident (Table 1). Metformin treatment was discontinued in case 1 and insulin therapy changed to sitagliptin/metformin combination in case 2. Results of genetic studies available later revealed a mutation of the MC4 receptor (homozygous) in both patients. Parents were both heterozous for the same mutation.

Table 1-patient characteristics and response to sleeve gastrectomy

	Case 1	Case 2
Age (years)	12	14
Gender	Male	Female
Birthweight	3.5 kg	3.5 kg
Age of obesity onset (years)	3	1
Age of diabetes diagnosis (years)	11	13
Weight before surgery (kg)	143	125
Weight after surgery (kg)	150	128
HbA1c before surgery (%)	8.1	?
HbA1c after surgery (%)	6.1	9.7

To our knowledge this is the first description of bariatric surgery in children with MC4 mutation. The positive outcome may have major implications for other such patients. It may also provide insights into the hormonal/biological pathways that result in diabetes improvement/cure after bariatric surgery.