

Body mass index in children and young people with Type 1 diabetes in England and Wales

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Aim

The aim of this study is to assess the current body mass index (BMI) distribution and explore the risk factors for obesity among children and young people with Type 1 diabetes.

Methods

The National Paediatric Diabetes Audit (NPDA) collates data on the demographic characteristics, care processes and outcomes in children and young people with diabetes under the care of paediatric diabetes units. This analysis used data collected in the 2013/14 audit period which includes data from all paediatric units in England and Wales.

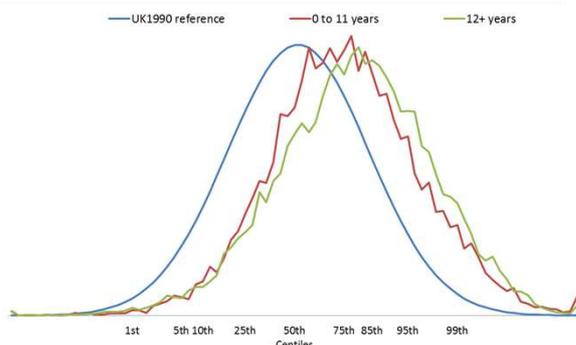
Age and sex specific BMI centiles were calculated using the UK 1990 reference population. Underweight was defined as below the 5th centile, overweight as above the 85th to the 95th centile and obesity as above the 95th centile.

Logistic regression models were created to assess the relative association between risk factors and being obese and underweight in children and young people with Type 1 diabetes.

Results

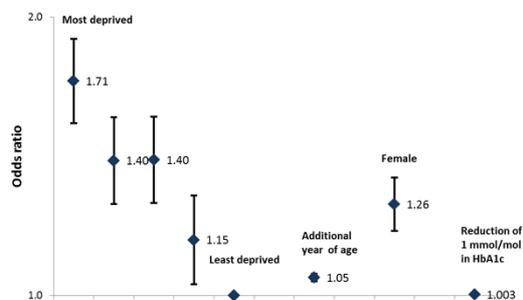
The 2013/14 NPDA included data on 25,357 children and young people with Type 1 diabetes of whom 93.4% had a valid BMI measurement recorded. Overall 1.6% were underweight, 57.5% were of healthy weight, 19.8% were overweight and 21.1% were classed as obese. There is a clear shift to the right in the distribution of BMI in children and young people with Type 1 diabetes compared to the UK1990 based reference population (see Figure 1). Comparisons to the national child measurement programmes show a significantly higher prevalence of overweight and obesity in those with Type 1 diabetes than in the general population.

Figure 1: BMI distribution compared to UK1990 population



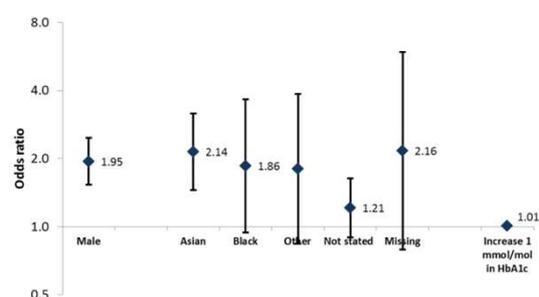
Those living in the more deprived areas were more likely than to be obese than those in the least deprived areas. The risk of being obese increased with age and being female. A reduction in current HbA1c of 1 mmol/mol was associated with an odds ratio (OR) of 1.003 (95% CI 1.001-1.005) (see Figure 2). Duration of diabetes and ethnic group were not statistically significantly associated with a differential risk of obesity.

Figure 2: Risk factors for obesity



Being male and from an Asian ethnic group (compared to White ethnic group) were associated with an increase risk of being underweight (see Figure 3). An increase of 1 mmol/mol in current HbA1c was associated with an OR of 1.008 (95% CI 1.002-1.014). Deprivation, duration of diabetes and age were not statistically associated with being underweight.

Figure 3: Risk factors for underweight



Conclusion

There is a worrying trend towards being a higher BMI in children and young people with Type 1 diabetes. The trend towards obesity in girls and in the most deprived areas is clearly recognised in the general population. The significant odds ratio of being obese with every 1 mmol/mol decrease in HbA1c suggests confounding influences of diabetes control which requires further evaluation.

The national report for the 2013/14 National Paediatric Diabetes Audit was published on 9th March 2015, see <http://www.rcpch.ac.uk/national-paediatric-diabetes-audit-npda> for further details.