Young people with Type 1 Diabetes of non-white ethnicity and lower socioeconomic status have poorer glycaemic control in England and Wales – A national population-based study

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Introduction
The impact of ethnicity & socioeconomic status (SES) on glycaemic control in children with type 1 diabetes (T1D) is poorly understood in England & Wales.

Methods
We studied 18,478 children with T1D aged <19 years attending clinics in England & Wales & included in the 2012-13 National Paediatric Diabetes Audit (NPDA). Self-identified ethnicity was categorized as White, Asian, Black, Mixed, Other & ‘Not Stated’. SES was estimated using postcode based Index of Multiple Deprivation (in quintiles). Multivariable linear regression was used to assess associations between ethnicity, SES & glycaemic control (mean HbA1c) accounting for age, gender & diabetes duration. Associations between SES & HbA1c were tested in models stratified by ethnicity. The impact of insulin pump use on the ethnicity/SES – HbA1c associations was tested in 13,962 children.

Results
• Ethnic minorities had higher mean HbA1c compared to White children. Largest differences observed in Black & Mixed children (7.84mmol/mol, 95% CI 5.07-10.6 & 6.81mmol/mol, 4.55-9.08 respectively).

• Lower SES was associated with higher mean HbA1c with a dose effect. Lowest SES group (quintile 5) had on average 6.78mmol/mol (5.63-7.95) higher mean HbA1c compared to highest SES group, adjusted for ethnicity.

• Estimates for ethnicity were attenuated but remained significant on adjustment for SES. Having a lower SES was associated with higher mean HbA1c irrespective of ethnicity in stratified analyses.

• Being in the lowest SES group & of Asian (6.90mmol/mol, 2.52-11.28), Mixed (11.26mmol/mol, 6.31-16.21) & Other (8.85mmol/mol, -0.05-17.5) ethnicity was associated with higher mean HbA1c compared to being in the corresponding lowest SES group & White ethnicity (6.03mmol/mol, 4.72-7.34). (Interaction test between ethnicity & SES was statistically significant , P=0.005).

• Ethnicity & SES remained significant predictors of HbA1c after accounting for insulin pump use.

Conclusions Ethnicity & SES are independently associated with glycaemic control in T1D children & young people. The effect of ethnicity independent to deprivation on glycaemic control persists after adjustment for pump use, indicating that an alternative approach to intensive insulin therapy for the treatment of glycaemic control is required in vulnerable children.