**BACKGROUND**

- Oral microbiota composition and diversity differ between obese and non-obese individuals.
- However, the associations between lifestyle habits (implicated in the pathogenesis of obesity) and the oral microbiota remain uncertain, particularly among children.

**OBJECTIVE**

To explore the associations between oral microbiota diversity and lifestyle habits among 8-10 year-old children.

**METHODS**

- Data stem from the QUALITY cohort, a prospective cohort study of 630 children with a parental history of obesity.
- Lifestyle habits were assessed at 8-10 yrs, including:
  - physical activity by 7-day accelerometry (moderate to vigorous physical activity or MVPA)
  - self-reported screen time
  - dietary intake (at 8-10 and 15-17 yrs only) by 3 non-consecutive 24h dietary recalls,
- Fitness was measured by VO2peak
- Oral plaque samples obtained from 78 participants underwent 16S-rRNA based microbial profiling for indices of diversity
- Measures of diversity include Shannon, Simpson, Chao1 and Observed OTU indices
- Pearson’s correlations assessed associations between diversity indices and lifestyle habits.

**RESULTS**

Participants in this subsample were on average 9.8 years old (SD 0.9), with 57 boys and 21 girls: 29 participants were of normal weight, 20 overweight and 29 obese, in keeping with the recruitment strategy targeting children with a family history of obesity. Baseline lifestyle habits at 8-10 yrs of age were as follows: MVPA 50.0 min/day (SD 25.6) and screen time 2.0 hrs/day (SD 2.0). Percentage of daily energy intake from carbohydrates was 52.5% (SD 6.0) and from saturated fat 11.6% (SD 2.6), on average. Mean fitness level was 59.3 mls/min.kg lean body mass (SD 6.6).

Physical activity, fitness and screen time were not associated with oral microbiota diversity at 8-10 yr.

**Figure 1:** Relative abundance (%) of measured ORAL MICROBIOTA bacterial species in non-obese children compared to obese children at 8-10 yrs

Percent carbohydrate intake was positively correlated with all measures of diversity (Obs OTUs r=0.22, p=0.06; Chao1 r=0.23, p=0.042; Shannon r=0.19, p=0.096; Simpson reciprocal r=0.20, p=0.076). Conversely, while not reaching statistical significance, modest negative correlations between total dietary fat and saturated dietary fat consumption and measures of oral microbiota diversity were noted (r = -0.14 to -0.17 across all indices).

**Footnote:** * indicates p < 0.10
V1: visit 1 (baseline), % carbohydrates: percentage of energy intake from carbohydrates, % saturated fat: percentage of energy intake from saturated fats, % total fat: % of energy intake from fat. Alpha-diversity indices used to assess richness include observed OTUs (Sobs) and the Chao1 index, whereas the Shannon and Simpson indices are measures of evenness.

**CONCLUSIONS**

These preliminary findings suggest that dietary intake in childhood is associated with the bacterial diversity of the oral cavity.