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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.

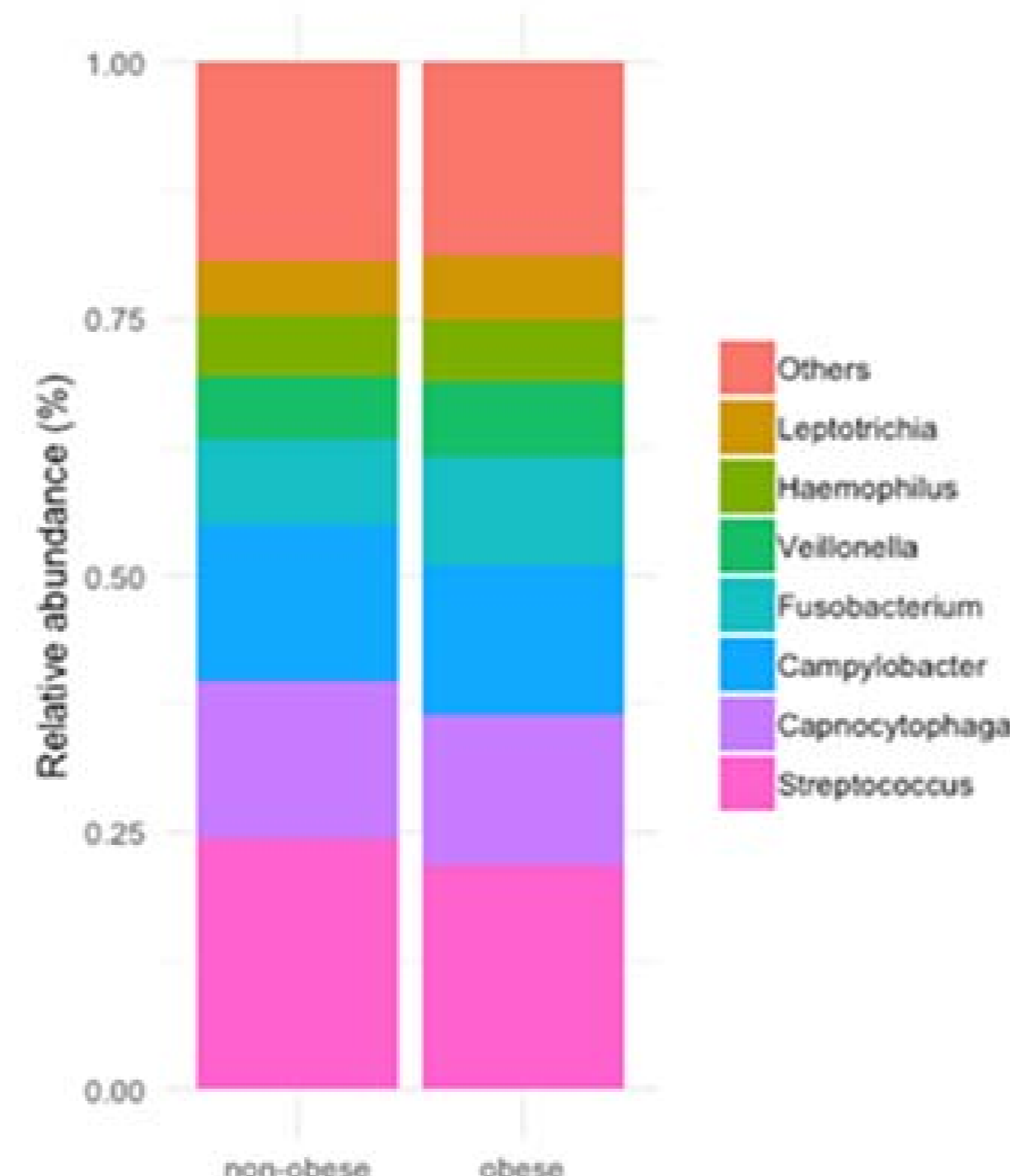
METHODS

- Data stem from the QUALITY cohort, a prospective cohort study of 630 children with a parental history of obesity

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).

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).

- 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.

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

Figure 2: Correlation heat map of oral microbiota alpha-diversity indices at 8-10 yrs and dietary intake at baseline (8-10 yrs)



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.