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Service provides; the adolescent decides: weight loss outcomes in a tertiary obesity service

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Background: Management of adolescent obesity requires a range of evidence-based dietary interventions [1]. This study explored the outcomes of a multidisciplinary weight management program for adolescents with obesity in a tertiary setting. The 6 month dietetic and medical led program offers adolescents the choice of 3 dietary interventions; a Very Low Energy Diet (VLED), Intermittent Energy Restriction (IER) and Higher Protein Diet (HPD).

Methods: A retrospective medical chart review of the Adolescent Weight Management Program at The Children's Hospital at Westmead between October 2014 to December 2017 was conducted. Participants ($n=57$) aged 14–17 y who engaged with the program were identified, and anthropometric data extracted for index calculations. Statistical analysis was intention-to-treat, and sub-group analysis was completed to compare sex, dietary interventions and attendance between engagers ($n=47$) and program completers ($n=10$).

Results: Weight-related outcomes significantly improved from baseline until last contact with the clinic: BMI z-score (-0.05 ± 0.45 , $p < 0.001$), weight (-2.32 ± 6.49 kg, $p = 0.021$), waist circumference (WC; -2.3 ± 6.49 cm, $p = 0.03$), BMI (-1.06 ± 2.08 kg/m², $p = 0.001$), BMI expressed as a percentage of the 95th percentile (BMI95; $-7.89 \pm 12.19\%$, $p < 0.001$) and Waist-to-Height ratio (WtHR; -0.02 ± 0.16 , $p = 0.01$). Attendance decreased over time. Increased contact with the clinic significantly improved all weight-related outcomes. Adolescents who completed the program ($n=10$) had significant reductions in weight related outcomes, including BMI z-score (-0.15 ± 0.13 , $p = 0.021$); and BMI95 ($-7.63 \pm 7.46\%$, $p = 0.043$). Girls ($n=6$) had greater reductions in BMI z-score and centile (-0.11 ± 0.06 , $p = 0.02$ and -0.35 ± 0.17 , $p = 0.017$) compared to boys. Changes in weight-related outcomes were greatest for adolescents following a VLED; $n=16$), particularly for BMI z-score (-0.12 ± 0.11) and BMI95 ($-5.44 \pm 6.19\%$), in comparison to the IER (-0.09 ± 0.13 , $-3.49 \pm 4.68\%$ respectively) and HPD (-0.05 ± 0.13 , $-1.12 \pm 5.01\%$ respectively).

Conclusions: The results demonstrate the effectiveness of real-world clinical practice for management of adolescent obesity. VLEDs produce greater weight reductions overall. Increased attendance at clinic lead to a significant improvement in all weight related outcomes.

Reference

- [1] Lister NB, Gow ML, Chisholm K, Grunseit A, Garnett SP, Baur LA. Nutritional adequacy of diets for adolescents with overweight and obesity: considerations for dietetic practice. *European Journal of Clinical Nutrition* 2017;71(5):646.

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Early adolescent weight gain and its relationship to the tempo and timing of puberty

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Introduction: Cross-sectional studies show an association between obesity and earlier timing of puberty. However, few studies have considered how the tempo of puberty potentially impacts upon weight and adiposity. This study assessed longitudinal associations for pubertal timing and tempo to weight-related outcomes in adolescents.

Methods: 226 healthy adolescents (46% female; 10–13 y at recruitment) from the ARCHER cohort study [1] of puberty hormones were followed over a 3-year period. Annual anthropometric and body composition (via bio-electrical impedance) measures were analysed against pubertal timing (earlier/later) and tempo (fast/slower) groups derived from non-linear growth curve modelling of annual self-reported Tanner stage.

Results: Earlier pubertal timing was significantly associated with higher absolute levels of adiposity (including weight, BMI z-score, waist circumference, waist-to-height ratio and fat mass) in girls, and more rapid increases in adiposity (including weight, BMI z-score and fat mass) over 3 years among boys (all $p < 0.05$). Faster pubertal tempo predicted more rapid increases in weight and BMI z-score over 3 years among girls (both $p < 0.05$), but paradoxically, less rapid increases in central adiposity (including waist circumference and waist-to-height ratio; both $p < 0.01$) among boys. Adjustment for baseline BMI z-score attenuated the pubertal timing associations observed in girls, but other results remained largely unchanged.

Conclusions: Pubertal timing and tempo showed sex-specific relationships to weight-related outcomes. This study identified pubertal tempo as a potentially relevant risk factor for weight and central adiposity in girls and boys, respectively. Findings for pubertal timing align with the cross-sectional evidence. However, our results in girls showed a stronger association for pubertal timing to pre-existing adiposity than weight gain during adolescence. The reverse was apparent in boys. These associations may assist in early identification of adolescents at risk of excess weight gain during adolescence. Findings also highlight the importance