Study: Timing of puberty varies in overweight vs. obese boys

from the AAP Department of Research

Data from a large and diverse group of U.S. boys offer new evidence that puberty may occur earlier among boys who are overweight and later among those who are obese. The findings are detailed in a recently published study involving the AAP Pediatric Research in Office Settings (PROS) network (Lee JM, et al. Pediatrics. 2016;127:e20150164).

Results of prior studies that have explored relationships between excess weight and timing of puberty in boys have shown mixed results. This may be due partly to different definitions of puberty or smaller sample sizes. In contrast, this large national study involved 212 pediatric clinicians from the PROS network and the Academic Pediatric Association’s Continuity Research Network (CORNET).

Researchers used testicular volume and genital stages to study the relationship between obesity and central puberty. Before starting the study, clinicians were trained in Tanner staging and use of a Prader orchidometer to measure testicular volume; received a manual of reference photographs of sexual maturity stages; and passed a qualifying exam. Definitions of Tanner stage and testicular volume were consistent with prior studies. Weight status was classified using the Centers for Disease Control and Prevention growth percentiles in three categories: normal weight (body mass index [BMI] from the 5th-84th percentile), overweight (BMI from the 85th-94th percentile) and obese (BMI over the 94th percentile).

Data were collected at well-child visits from 3,872 boys ages 6-16 years (49% white, 26% African-American and 24% Hispanic). Clinicians recorded height and weight (to the nearest 0.5 kilogram) using their usual office procedures and assessed Tanner stages and testicular volume using study procedures and equipment.

Statistical analyses were used to determine population distributions of puberty outcomes across the age spectrum, overall and by each race/ethnic group. Probit regression models were used to predict the probability of having puberty by age for each Tanner stage of genital development: 2 or greater; 3 or greater; 4 or greater; 5 or greater. Simulation analyses were used to identify statistically significant differences across different weight groups.

Overall, results show evidence of earlier puberty for overweight boys compared with normal or obese boys and later puberty for obese boys compared with normal and overweight boys. However, these differences were not consistent across all pubertal stages or all races/ethnicities — distinctions that have not been measurable in prior studies. The study’s large sample size also made it possible to compare pubertal outcomes across different and distinct weight categories — something smaller studies have been unable to do (see figure).

These findings add more nuanced insight into the complex relationship between boys' puberty, overweight and obesity. A potentially nonlinear relationship between pubertal timing and body fat in boys highlights the need for further research to evaluate pubertal outcomes across a spectrum of weight categories.

This study involved collaboration among researchers at The University of Michigan; University of Vermont; Alfred I. DuPont Hospital for Children in Wilmington, Del.; CORNET; the National Medical Association NMA-PedsNet; Baystate Children's Medical Hospital in Springfield, Mass.; Tufts University School of Medicine in Boston; the University of North Carolina at Chapel Hill; and the Academy.

The project was supported in part by the U.S. Department of Health and Human Services (HHS) under grant number UA6MC15585. This content and conclusions are those of the authors and should not be construed as the official position or policy of, nor should any endorsements be inferred by HHS or the U.S. government.

RESOURCES

- For more information about PROS, visit http://www2.aap.org/pros or contact Laura Stone, in the AAP Division of Primary Care Research, at 800-433-9015, ext. 7319, or lstone@aap.org.
- For more information and simulated practice with motivational interviewing to address overweight and obesity in primary care, visit https://hcw.aap.org/resources/Pages/default.aspx.
- For more information on childhood obesity and resources for practitioners, visit Pediatric E-Practice (PEP); Childhood Obesity at http://pep.aap.org/. Full access to PEP is an AAP member benefit.

Age of puberty development of U.S. boys, measured as the median age at each Tanner stage, 2 through 5, by race/ethnicity and weight status

Pediatric Research in Office Settings names new director

from the AAP Department of Research

Alexander G. Fiks, M.D., M.S.C.E., FAAP, has been appointed director of the AAP Pediatric Research in Office Settings (PROS) network after a national search.

Dr. Fiks succeeds Richard C. “Mort” Wasserman, M.D., M.M.H., FAAP, who led PROS for nearly 25 years. Under Dr. Wasserman’s leadership, the PROS network grew to over 700 U.S. practices and conducted groundbreaking studies in varied areas, including the management of febrile infants, timing of puberty in girls and boys, and behavior and lifestyle change to improve health.

Dr. Fiks is a primary care pediatrician and an associate professor of pediatrics at the Perelman School of Medicine at the University of Pennsylvania and The Children’s Hospital of Philadelphia (CHOP). His research aims to improve outcomes for ambulatory pediatric patients through collaborative practice-based research, with a focus on using health information technology to improve health and health care decision-making.

As associate director of PROS since September 2013, Dr. Fiks has been involved in building electronic health record (EHR)-based research through two initiatives — Collaborative Electronic Reporting for Comparative Effectiveness Research, which includes more than 1.2 million U.S. children from multiple health systems, and ePROS.

As director of PROS, Dr. Fiks will assume leadership of a network with a nearly 30-year history of research that guides practice and policy. Among Dr. Fiks’ goals are broadening the range of PROS studies to include large clinical trials, secondary analyses of EHR data from practices and longitudinal surveys of practitioners. In addition to its work in epidemiology and health services research, the network will welcome quality-oriented research.

To achieve these goals, PROS will continue partnering with practicing pediatricians, who have informed studies since the network’s inception, as well as parents and other stakeholders. PROS especially welcomes investigators interested in primary care-oriented research, as the network strives to test ideas that innovate the delivery of family-centered pediatric care.

Dr. Fiks received a medical degree from Harvard University, a master’s of science in clinical epidemiology degree from the University of Pennsylvania and additional training in clinical informatics. At CHOP, he is associate medical director for the Pediatric Research Consortium, a practice-based research network; associate director of the Center for Pediatric Clinical Effectiveness; a founding member of the Department of Biomedical and Health Informatics; and a PolicyLab faculty member. He also mentors multiple faculty and academic fellows.

Dr. Fiks is a member of the AAP Council on Clinical Information Technology and the Section on Advances in Therapeutics and Technology.