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Association of FTO rs9939609 polymorphism and lifestyle factors with obesity measures in Chinese children at puberty

Fan Jiang

Shanghai Key Laboratory of Children's Environmental Health, China

Accumulating studies have showed that fat mass and obesity-related gene (FTO) rs9939609 to be associated with obesity, however few studies explored the modification of lifestyles factors on FTO for children at puberty. Our objective was to investigate effects of FTO rs9939609 and lifestyle factors on obesity of Chinese children at puberty. The study included 1149 children aged 10-12 years from 10 primary schools in Shanghai, China. Children's body mass index (BMI) and body fat percentage (BF%) were measured with FTO rs9939609 genotyped from whole blood, and multiple lifestyle factors were surveyed through parental or self-report questionnaires. FTO rs9939609 and non-genetic factors (gender, age, delivery method, birth weight, weekday TV, appetite, sleep, tanner stage, parent's BMI and father's education) were separately associated with BMI and BF%. Rs9939609 significantly explained 0.35% and 0.61% variance for BMI and BF% respectively after controlling for confounding factors. An interaction effect between rs9939609 and soft drinks was observed with $p=0.01$ for BMI and $p=0.077$ for BF%, but no interactions between FTO and other lifestyle factors were found. Bioinformatics study showed rs9939609 and its linkage disequilibrium (LD) SNPs ($r^2>0.8$) are inside regulatory elements of open chromatin, transcription factor binding site (TFBS) and histone modification regions for blood, pancreatic and brain tissue cells. FTO rs9939609 had an obvious and independent effect on obesity in Chinese children. FTO and its interaction with lifestyle factors may take effects through the modifications of genetic regulation elements, thus a specific lifestyle risk factor can modify genetic predisposition to children's obesity.

Biography

Fan Jiang got her PhD of Pediatrics from Shanghai Jiaotong University School of Medicine in 2005. She is the Party Secretary of Shanghai Children's Medical Center affiliated Shanghai Jiaotong University School of Medicine. She has been worked in Wisconsin Children's Hospital and Cincinnati Children's Medical Center for one year each respectively. In 2012, she spent 3 months in WHO working for harmonization of global birth cohort. Currently, she is an Associate Professor of Pediatrics of Shanghai Children's Medical Center, and Vice director of Ministry of Education-Shanghai Key Laboratory of Environment and Child Health, as well as Adjunct Professor of Pediatrics in Cincinnati Children's Medical Center. She has served as vice chair of Chinese Child Health Care Association and member of Chinese Public Health Association. Her major research interests are social environmental change & child health and development. She published more than 70 research papers in the area of Child Health and Development.

fanjiang@shsmu.edu.cn