Strictly embargoed until 17th May at 18:00 London time

Novel genes found for menarche and menopause

Genes controlling menopause and menarche have been identified in two studies by UK twin researchers at the Department of Twin Research, King's College London and published today in *Nature Genetics.*

Menopause is the time of a woman's life when menstrual cycle ceases owing to depletion of the follicle pool (eggs) whereas menarche is the time of the start of menstruation. Menarche occurs at a mean age of 13 years, normally about two years after the onset of puberty and Menopause occurs around 50 years of age. Both events are highly heritable and key to fertility and early menopause in particular is an important risk factor for several major age-related diseases such as osteoporosis, cardiovascular disease, and certain cancers- such as breast and ovary.

The two studies published today in *Nature Genetics* were a collaborative effect of the researchers from King's College London, Erasmus MC Rotterdam, the Netherlands, and the CHARGE Consortium which consisted of eight cohort studies conducted in the institutes or universities from Europe and the United States.

For menopause, the researchers conducted a two-staged genome-wide association study for age at natural menopause in 2,979 European women and identified six SNPs in three loci associated with age at natural menopause. Women with these genes were likely to have a premature menopause.

For menarche, the researchers performed a meta-analysis of genome-wide association data in 17,510 women from eight cohorts. The strongest signal was at chromosome 9q31.2, where the nearest genes include TMEM38B, FKTN, FSD1L, TAL2 and ZNF462. The next best signal was near the LIN28B gene on chromosome 6, which also influences adult height. These genetic variants were associated with an early menarche and the genes were also linked to body weight - which are also triggers for the onset of periods in girls. Genes causing earlier menarche also caused smaller adult height.

Professor Tim Spector, Director of the Department of Twin Research Department and joint senior author of the study says: "*these are the first studies to provide evidence for common genetic variants influencing normal variation in the timing of female sexual maturation and of ovarian ageing. These studies give us a better understanding of the function of the genetic variants involved in early menopause and early menarche. Female fertility is a crucial trait for humans and these genes will help with new treatments and prediction for women with early menopause or early puberty*".

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Notes to editors:

The paper, ***Loci at chromosomes 13, 19 and 20 influence age at natural menopause*** will be published online in *Nature Genetics* on 17 May 2009. To view the paper, please visit: http://www.nature.com/ng/index.html

The paper ***Meta-analysis of genome-wide association data identifies two loci influencing age at menarche*** *will be* published online in *Nature Genetics* on 17 May 2009. To view the paper, please visit: http://www.nature.com/ng/index.html

Further information

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The Department of Twin Research and Genetic Epidemiology at King's College London has a database of 10,000 twins and studies a wide variety of diseases and traits and has lately expanded their research on human sexuality, leading to several high profile publications. For more information and pdf-copies of other publications please phone: 020 7188 6765 or visit the website: www.twinsUK.ac.uk