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Summary of research

Key words: Shift work, sleep, cancer and cardiovascular disease

Shift work, and in particular night work, has been linked in several studies to an increased risk of several common diseases including certain cancers, cardiovascular disease and type 2 diabetes. However, other studies have not found such associations and it is unclear why risk of these diseases might be higher among shift workers. Possible reasons include the harmful effects of disturbed patterns of certain hormones due to electric light at night, shift workers having disturbed sleep or shift workers being more likely to have known lifestyle risk factors for disease.

To better understand the possible relationship between shift work and disease, we aim to compare the characteristics of UK Biobank participants who have and have not done shift work or night work. In subsequent phases of the project we propose to examine the relationships between shift work, sleep and subsequent risks of breast cancer, prostate cancer, cardiovascular disease, diabetes and death. These phases will be conducted when at least 2000 incident cases of each endpoint have accrued in UK Biobank. This project will contribute towards a fuller understanding of a potentially important and modifiable occupational risk factor for several common diseases.
PROJECT EXTENSION - APPROVED 03.04.2017

As part of the programme of analyses on the relationship between shift work, related factors and disease risk in the UK Biobank cohort (project 431), we would like to now incorporate the available genetic data. These data would be used for the cross-sectional study of associations with shift work and related factors (sleep characteristics and chronotype), and for the main prospective analyses of disease risk. The results from cross-sectional analyses will provide information on potential mechanisms and explanatory factors that may mediate any associations between shift work and disease and will inform the design of the prospective analyses of shift work of disease, for example allowing stratification of analyses by participant traits, including for example genetically determined chronotype.

The genetic data will be used for several components of the project, including the use of selected genotypes as instrumental variables for characteristics such as chronotype, to allow us compare results from analyses of self-reported exposure data in relation to disease risk to results from genetically determined exposures. This Mendelian randomisation approach will provides insights into whether observed associations are causal. The genetic data will also be used to better understand factors associated with the main exposures, and analyses may include GWAS to establish whether there are genetic traits associated with long-term shift working, i.e. tolerance of chronic circadian disruption.

The requested variables are as follows:
22000 Batches
22006 Genetic ethnic grouping
22009 Genetic principal components
22013 Genetic relatedness IBS0
22012 Genetic relatedness factor
22011 Genetic relatedness pairing
22001 Genetic sex
22003 Heterozygosity
22004 Heterozygosity, PCA corrected
22005 Missingness
22010 Recommended genomic analysis exclusions
22052 UKBiLEVE unrelatedness indicator

And all of the data fields in the following categories:
100315 Genotype calls & imputation
(i.e. data fields 220101 to 22125 for the genotype type calls)
100316 Genotype confidences
100317 Genotyping intensities
100318 Genotyping process