Night Work

Y Suwazono et al. J Occ Env Med (2006) Vol.48 p 455 – 461.
Long-Term Longitudinal Study on the Relationship Between Alternating Shift Work and the Onset of Diabetes Mellitus in Male Japanese Workers

Dysregulation of blood glucose is linked to a large number of serious disorders including heart disease. This study reports a link between shift work and elevated blood glucose levels [possibly a sign of diabetes]. Further work is needed to establish whether this is the norm or just a result of the timing of the testing work.

Previous studies have provided some evidence that insulin sensitivity varies in a diurnal pattern with higher insulin resistance at night. Eating during the night could therefore lead to higher blood glucose levels, imitating the effect of type 2 diabetes.

This study was based on workers at a steel factory operating with both day shift and alternating shift work patterns. All employees underwent annual medical checks. 5,629 out of a possible 6,495 male employees took part in the study. Those with evidence of diabetes at baseline were excluded from the analyses as were those with cardiovascular disease, hyperlipidaemia or cancer. Diagnosis of diabetes was made on the basis of GP records or by means of a blood test at the time of the annual health check which always occurred during day time. Working patterns were ascertained from employment records. The study had a 10 year observation period.

Age, body mass index (BMI), mean blood pressure (MBP), drinking habits, smoking habits, habitual exercise, and level of total serum cholesterol, creatinine, γ-glutamyl transpeptidase (γ-GTP), and uric acid (UA) were evaluated as potential contributing or confounding factors.

On average, shift workers were older, drank alcohol more frequently smoked more and did less exercise.

The incidence rates for diabetes were 5.7 per 1000 person-years in day shift workers and 7.4 per 1000 person-years in alternating shift workers; odds ratio 1.35 (95% CI = 1.05 to 1.75). The risk was still significant after adjusting for the above risk factors.

Comment
The blood test method for identifying cases of diabetes that was used in this research is not yet completely validated but results show it can be useful in some circumstances. In our view, the possibility that blood glucose levels were raised because of the timing of the test should be analysed in more detail; shift workers did have higher levels of blood glucose at the time of measurement but insulin resistance is known to vary throughout the day.

A risk ratio of 1.35 indicates a moderate/weak risk; not sufficient to establish causation on the balance of probabilities. Risks of this magnitude could arise through errors in dealing with confounding factors but the narrow confidence interval suggests that this may not be a significant effect in this research.