

## Effect Of Shift Work Induced Sleep Deprivation On Diabetes & Kidney Problems

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### ABSTRACT

Cross sectional survey using Modified Global Sleep Assessment Questionnaire (MGSAQ) of general and night shift worker populations of Jharkhand revealed a direct correlation between night shift work and sleep loss related physiological disorders like diabetes and kidney problems. Insomnia and RSBD were reported five-fold and two-fold increased respectively in shift worker if compared to general population. Prevalence of diabetes in shift workers was two-fold higher and the kidney problems which were almost absent in general population was ten-fold elevated. Thus shift work induced sleep deprivation may initiate problems in glucose homeostasis as well as kidney problems through internal stress to physiology.

**Key words :** Shift work, sleep deprivation, diabetes

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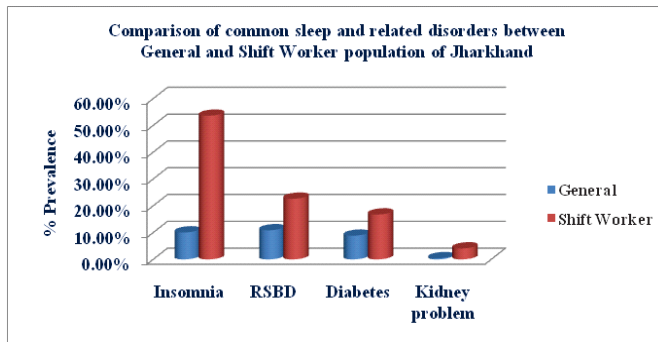
### Introduction

To have normal health, sleep is must, but very little is known about its function and mechanism in maintaining normal physiology. It is the population health that defines the growth and economy of a state or a country as a whole. It is necessary to have the documentation of the sleep status of each state to evaluate the health status of the country. Several societies and associations had been formed towards combating the sleep related disorders through out the world like European Sleep Research Society (ESRS), American sleep association (ASA), Japanese Sleep Research Society (JSRS), World Association of Sleep Medicine (WASM), British Sleep Society (BSS), Indian Society for Sleep Research (ISSR), Indian Sleep Disorder Association (ISDA) etc. There are survey reports of sleep related disorders from different states of India (1). The survey of sleep status in the population of Jharkhand remains

unreported since its formation in the year 2000. There are reports of association of sleep quality and sleep duration with related physiological disorders like diabetes and kidney problems (2, 3, 4, 5). We here report for the first time a survey based findings that clearly correlates the increase of sleep disorders like Insomnia and /or RSBD with the onset of diabetes and/or kidney problems in night shift worker population as compared to general population.

### Methodology

A MGSAQ based population survey was carried out to evaluate the prevalence of sleep disorders and physiological problems due to night-time sleep loss. The MGSAQ was translated into three languages (Hindi, Bengali and Santhali) for better communication with the indigenous people. The questions were verbally communicated in their respective languages to those people who were



unable to read the MGSAQ by their own. Informed consent was taken from each and every human participant through the MGSA questionnaire. We considered 442 of human subjects who were shift-workers and naturally prone to sleep related disorders as a consequence of occupational hazards and 3264 of general population for comparison. Sleep disorders like Insomnia, snoring, sleep apnea, RSD (REM Sleep Behaviour Disorder), narcolepsy, day time sleepiness, not enough sleep, RL syndrome, feeling not refreshed after waking up, PLMD (Periodic Limb Movement Disorder) etc were evaluated by the answers given by the study participants in responses to the MGSAQ.

## RESULTS

We reported more than 50.0 % of shift workers had been suffering from Insomnia as compared to 10.04 % of general population. The symptom of snoring was almost doubled in shift worker population (27.14 %) compared to general population (16.17 %), but the occurrence of breathing related symptom of Sleep Apnea remains the same (~9 %). The percentage of occurrence of RSD was more than double in case of shift workers (22.62 %) than general population (10.84 %). We also checked the symptoms of other sleep disorders mentioned above and were found more or less similar in both general and shift worker populations.

## Discussion

Insomnia, the main sleep disorder, was reported five-fold increased in night shift workers than general population. Prevalence of two-fold increase in the RSD subjects we had encountered in night shift workers can be explained by the fact that truck drivers and duty nurses were mostly taken as shift worker population and were usually prone to have violent dreams because of their very professions. Prevalence of diabetes in shift workers was two-fold higher and the kidney problems which were almost absent in general population was ten-fold elevated. From the above findings we had inferred a direct correlation of Insomnia and RSD with the increase of diabetes and kidney problems in shift worker population.

## References

- Panda S, Taly A B, Sinha S, Gururaj G, Girish N, Nagaraja D. 2012, "Sleep-related disorders among a healthy population in South India". *Neurology India*. 60 (1): 68-74.
- Engeda J, Mezuk B, Ratliff S, Ning Y. 2013, "Association between duration and quality of sleep and the risk of pre-diabetes: evidence from NHANES." *Diabetic Medicine*. 30 (6): 676-680.
- Ohkuma T, Fujii H, Iwase M *et al.* 2013, "Impact of sleep duration on obesity and the glycemic level in patients with type 2 diabetes: the fukuoka diabetes registry". *Diabetes Care*. 36 (3): 611-617.
- Ahmad S, Gupta M, Gupta R, Dhyan M. 2013, "Prevalence and correlates of insomnia and obstructive sleep apnea in chronic kidney disease." *N Am J Med Sci*. 5 (11): 641-6.
- Hanly P J, Ahmed S B. 2014, "Sleep apnea and the kidney: is sleep apnea a risk factor for chronic kidney disease?" *Chest*. 146 (4): 1114-22.