

Journal Scan

U. C. Ojha

Senior Chest Physician, ESI Hospital, Basaidarapur, New Delhi

.....
Indian J Sleep Med 2009; 4.1, 32-36

Recent publications in 2008 on shift workers and their health effect

A review of work schedule issues and musculoskeletal disorders with an emphasis on the healthcare sector.

U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health (NIOSH), Division of Applied Research and Technology, Cincinnati, OH 45226-1998, USA.

Caruso CC, Waters. Ind Health. 2008 Dec;46(6):523-34.

This review article is regarding work schedule and musculo-skeletal disorders (MSD). This aspect has long been ignored. Work-schedule and MSD have multifaceted impact on health and cause significant morbidity in health care workers. The influence of shift work and long work hours on risk for MSDs is an area that needs further exploration. The purpose of this report is to assess various research progress and gaps across studies that examined the relationship between demanding work schedules along with the MSD outcomes. A literature search identified 23 peer-reviewed publications in the English language that examined MSDs and long work hours, shift work, extended work shifts, mandatory overtime, or weekend work. Eight studies that examined long work hours and had some controls for physical job demands *reported a significant increase in one or more measures of MSDs*. Fourteen studies examining shift work had incomparable methods and types of shift work, and therefore, no clear trends in findings were identified. A small number of studies examined mandatory overtime, work on weekends and days off, and less than 10 h off between shifts. Given the complexity of the work schedule research topic, relatively few studies have adequately examined the relationship of work schedules and

.....
Address for correspondence:

E.mail : ucojha@rediffmail.com

musculoskeletal outcomes. The review also discusses research gaps including methodological issues and suggests research priorities.

Does evening work predict sickness absence among female carers of the elderly?

Tüchsen F, Christensen KB, Nabe-Nielsen K, Lund T. National Research Centre for the Working Environment, Lersø Parkallé 105, DK-2100 Copenhagen Ø, Denmark.ftu@nrcwe.dk

Scand J Work Environ Health. 2008 Dec;34(6):483-6

The aim of the present study was to predict the risk ratio of sickness absence lasting > 2 weeks due to shift work among Danish workers caring for the elderly during the evening and at night. They were interviewed in 2005. The response rate was 78%. A cohort of 5627 shift and day workers was followed for sickness absence lasting more or equal to two weeks and for sickness absence lasting more or equal to eight weeks in a sickness compensation register covering all social transfer payments in Denmark. Among the evening workers, the rate ratio (RR) of sickness absence lasting more or equal to two weeks was 1.29 (95% confidence interval (95% CI) 1.10-1.52). The rate ratio for sickness absence lasting more or equal to 8 weeks was 1.24 (95% CI 0.99-1.56).the conclusion drawn was, Evening work may cause long-term sickness absence lasting or equal to two weeks.

The alerting effect of hitting a rumble strip—a simulator study with sleepy drivers

Anund A, Kecklund G, Vadeby A, Hjälmdahl M, Akerstedt T.) Clinical Neuroscience, Karolinska Institutet, SE-177 71

Stockholm, Sweden. anna.anund@vti.se

Accid Anal Prev. 2008 Nov;40(6):1970-6

A moving base driving simulator experiment was carried out in order to investigate the effects of milled rumble strips on driver fatigue. There were rumble strips both at the edge line and centre line. Four different physical designs of milled rumble strips (yielding noise values from 1.5 to 16 dBA) and two placements on shoulder were used in the experiment. Sound and vibrations from real milled rumble strips were reproduced in the simulator. A total of 35 regular shift workers drove during the morning hours after a full night shift. The main results showed an increase in sleepiness indicators (EEG alpha/theta activity, eye closure duration, standard deviation of lateral position, subjective sleepiness) from start to before hitting the rumble strip, an alerting effect in most parameters (not subjective sleepiness) after hitting the strip. The alertness enhancing effect was, however, short and the sleepiness signs returned 5 min after the rumble strip hit. Essentially no effects were seen due to type of strip. The study concluded that various aspects of *sleepiness are increased* before hitting a rumble strip and that the effect is very short-lived. Type of strip, as used in the present study did not have any effect.

Efficacy and hypnotic effects of melatonin in shift-work nurses:

A double-blind, placebo-controlled crossover trial.

Sadeghniaat-Haghighi K, Aminian O, Pouryaghoub G, Yazdi Z. Baharloo Hospital, Tehran University of Medical Sciences, Tehran, Iran. sadeghniaat@tums.ac.ir.

J Circadian Rhythms. 2008 Oct 29;6:10

BACKGROUND: Night work is associated with disturbed sleep and wakefulness, particularly in relation to the night shift. Circadian rhythm sleep disorders are characterized by complaints of insomnia and excessive daytime sleepiness that are primarily due to alterations in the internal circadian timing system or a misalignment between the timing of sleep and the 24-h social and physical environment.

METHODS: The effect of oral intake of 5 mg melatonin taken 30 minutes before night time sleep on insomnia parameters as well as subjective sleep onset latency, number of awakenings, and duration of sleep was evaluated. A double-blind, randomized, placebo-controlled crossover study with periods of 1 night and washouts of 4 days comparing melatonin with placebo tablets

was conducted. The authors tried to improve night-time sleep during recovery from night work. Participants were 86 shift-worker nurses aged 24 to 46 years. Each participant completed a questionnaire immediately after awakening.

RESULTS: Sleep onset latency was significantly reduced while subjects were taking melatonin as compared with both placebo and baseline. There was no evidence that melatonin altered total sleep time (as compared with baseline total sleep time). No adverse effects of melatonin were noted during the treatment period.

CONCLUSION: Melatonin may be an effective treatment for shift workers with difficulty falling asleep.

Effects of a combination of napping and bright light pulses on shift workers sleepiness at the wheel: a pilot study.

Leger D, Philip P, Jarriault P, Metlaine A, Choudat D. Centre du Sommeil et de la Vigilance Hotel Dieu AHP, Université Paris Descartes, Paris, France.

J Sleep Res. 2008 Oct 14.

To assess the effects of napping + bright light on shift work drivers sleepiness at the wheel, the authors performed a pilot study on nine shift workers on three shifts (morning, afternoon, night), driving on a private road circuit. Sleepiness at the wheel was measured by ambulatory polysomnography and assessed using 30-s segments of recordings with a percentage of *theta EEG of at least 50% (15 s) of the period recorded*. Sleepiness was also assessed by the Stanford Sleepiness Scale (SSS). Participants drove the same car on two similar 24-hour periods of work, with three pilots in each shift (morning, afternoon, night), separated by 3 weeks. During the baseline period, the subjects were told to manage their rest as usual. During the second experimental period, they had to rest lying in a dark room with two naps of 20 min and then exposed to bright light pulse (5000 lux) for 10 min. Subjects showed a significantly decreased sleepiness at the wheel with an average 10.7 +/- 6.7 episodes of theta sleep during the baseline (766 +/- 425 s) versus 1 +/- 1 episode lasting (166 +/- 96 s) during the second period (P = 0.0016; P = 0.0109). The percentage of driving asleep was also significantly reduced (3.7% +/- 1.9% versus 0.9% +/- 0.6, P = 0.0077). The average SSS score in the group decreased from 2.76 +/- 1.27 to 2.28 +/- 0.74 (P = 0.09). In this pilot and preliminary study, a combination of napping and bright light pulses was powerful in decreasing sleepiness at the

wheel of shift work drivers.

Multiple sleep latency test and maintenance of wakefulness test.

Sullivan SS, Kushida CA. Department of Psychiatry and Behavioral Science, Stanford University, Stanford, CA, USA.

Chest. 2008 Oct;134(4):854-61.

Excessive daytime sleepiness and fatigue are common complaints in the sleep clinic. The objective evaluation and quantification of these symptoms is important for both the diagnosis of underlying health problems and for gauging treatment response. The multiple sleep latency test measures physiologic sleepiness, whereas the maintenance of wakefulness test (MWT) aims to measure manifest sleepiness. Neither test correlates well with subjective measures of sleep such as the Epworth sleepiness scale and the Stanford sleepiness scale. Although in the past methodological testing differences existed, in 2005 updated practice parameters were published, promoting the standardization of testing procedures. In recent years, there has been an effort to document daytime sleepiness when associated with occupational risk. However, these laboratory-based tests may not reflect or predict real-life experience. Normative data for both tests, particularly the MWT, are limited, and are inadequate for the evaluation of pediatric patients, shift workers, and others.

The effect of occupation and industry on the injury risks from demanding work schedules.

Dembe AE, Delbos R, Erickson JB. Division of Health Services Management and Policy, The Ohio State University College of Public Health, Columbus, Ohio 43210, USA. adembe@cph.osu.edu

J Occup Environ Med. 2008 Oct;50(10):1185-94.

OBJECTIVE: Employees working in nonstandard shifts and long-hour schedules have an increased risk for job related injuries and illnesses. This study estimates the extent of that risk among various occupations and industries.

METHODS: Longitudinal data for 13 years among a sample of nearly 11,000 employees aged 22 to 43 was

used to calculate the risk of injury by occupation and industry for six types of demanding work schedules. Cox proportional hazard regression analyses were used to estimate risks within specific occupational and industrial classifications.

RESULTS: The greatest risks of job-related injury were among 1) construction workers in evening shifts, 2) professional, technical, and managerial personnel working overtime schedules, and 3) employees working overtime shifts in the business and repair services sectors.

CONCLUSIONS: Injury prevention efforts should be targeted toward employees in specific industries and occupations who work certain long-hour and shift work schedules.

Police officers attitude to different shift systems: association with age, present shift schedule, health and sleep/wake complaints.

Kecklund G, Eriksen CA, Akerstedt T. Stress Research Institute, Stockholm University, SE - 106 91 Stockholm, Sweden. goran.kecklund@ stressforskning.su.se, goran.kecklund@stressforskning.su.se

Appl Ergon. 2008 Sep;39(5):565-71.

It is often claimed that shift workers give priority to long series of days off and therefore prefer compressed work schedules at the expense of what is optimal for long-term health. The aim of the present study was to evaluate the attitude to six new shift systems among a randomly selected sample of police officers. The results showed that the most popular shift system was a rapidly, forward, rotating schedule with at least 16 h of rest between shifts, despite that it had fewer days off compared with some of the compressed shift systems. However, the individual differences were large and many individuals (32%) disliked the rapidly rotating shift system. Young age was associated with a positive attitude to the rapidly rotating shift system. The attitude to the shift system was also influenced by the present schedule, and shift systems that were similar to the present work hours received more positive evaluation. Sleep and health complaints showed no association with the attitude to the shift systems.

In conclusion, the shift workers attitude to the new schedules was partly in agreement with the ergonomic

recommendations of the design of three-shift systems that will facilitate sufficient sleep and minimize negative health consequences.

Shift work is a risk factor for increased blood pressure in Japanese men: a 14-year historical cohort study.

Suwazono Y, Dochi M, Sakata K, Okubo Y, Oishi M, Tanaka K, Kobayashi E, Nogawa K.

Department of Occupational and Environmental Medicine, Graduate School of Medicine, Chiba University, Chuoku, Chiba, Japan. *suwa@faculty.chibau.*

Hypertension. 2008 Sep;52(3):581-6.

To clarify the effect of shift work on blood pressure in Japanese men, a 14-year historical cohort study was conducted in day workers (n=3963) and alternating shift workers (n=2748) who received annual health checkups between 1991 and 2005 in a Japanese steel company. The end points were a $\geq 10\%$, $\geq 15\%$, $\geq 20\%$, $\geq 25\%$, or $\geq 30\%$ increase in systolic blood pressure or diastolic blood pressure from baseline during the period of observation. The association between shift work and an increase in blood pressure was investigated adjusting for age, body mass index, hemoglobin A1c, total serum cholesterol, creatinine, aspartate aminotransferase, gamma-glutamyl transpeptidase, uric acid, drinking habit, smoking habit, and habitual exercise by multivariate pooled logistic regression analyses. Shift work was significantly associated with the various end points. The odds ratios (and 95% CIs) were as follows: $\geq 10\%$, 1.15 (1.07 to 1.23); $\geq 15\%$, 1.21 (1.12 to 1.31); $\geq 20\%$, 1.15 (1.04 to 1.28); $\geq 25\%$, 1.20 (1.06 to 1.37); and $\geq 30\%$, 1.23 (1.03 to 1.47) for systolic blood pressure and $\geq 10\%$, 1.19 (1.11 to 1.28); $\geq 15\%$, 1.22 (1.13 to 1.33); $\geq 20\%$, 1.24 (1.13 to 1.37); and $\geq 25\%$, 1.16 (1.03 to 1.30) for diastolic blood pressure. Our study in male Japanese workers revealed that alternating shift work was a significant independent risk factor for an increase in blood pressure. Moreover, the effect of shift work on blood pressure was more pronounced than other well-established factors, such as age and body mass index.

Shift work and type 2 diabetic patients' health

Chalernvanichakorn T, Sithisarankul P, Hiransuthikul N. Department of Preventive and Social Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand.

J Med Assoc Thai. 2008 Jul;91(7):1093-6.

OBJECTIVE: To compare the health between type 2 diabetic patients doing day work and shift work.

MATERIAL AND METHOD: Two hundred and forty workers (120 day workers, 120 shift workers) aged 30-60 years were selected from the Social Security Clinic in five hospitals in Bangkok and its vicinity. All participants in the present study filled out the questionnaires that included questions for detecting hypoglycemic symptoms, Thai GHQ—12 questionnaires, and Suanprung Stress Test—20 questionnaires. Fasting blood glucose during the last six months, blood pressure during the last six months, and body mass index (BMI) were collected from the patient's medical records. All results were collected and compared between day workers and shift workers.

RESULTS: Good glycemic control was significantly higher in day workers versus shift workers (28.3% vs. 15.8%). A higher proportion of shift workers had hypoglycemic symptoms and abnormal mental health compared to day workers.

CONCLUSION: Shift work may have a negative effect on type 2 diabetic patients' health. Consequently, type 2 diabetic shift-worker needs more attention from physicians and employers at their work place.

Effects of shift rotation and the flexibility of a shift system on daytime alertness and cardiovascular risk factors.

Viitasalo K, Kuosma E, Laitinen J, Härmä M. Finnair Health Services, Finnair Plc, IF/67, FI-01053 Finnair, Finland. *katriina.viitasalo@finnair.com*

Scand J Work Environ Health. 2008 Jun;34(3):198-205.

OBJECTIVES: A controlled intervention study was conducted to evaluate the effects of two changes in shift characteristics on alertness and cardiovascular risk factors: a change in shift rotation (direction and speed) and a change

in the flexibility of the shift system.

METHODS: Altogether 84 male workers currently working in a backward-rotating shift system volunteered for the study. A total of 40 men changed to a rapidly forward-rotating shift system, 22 changed to a more flexible shift system, and 22 remained with the old shift system. Health effects were studied with the use of clinical measurements, blood tests, and questionnaires before and after the shift changes. Analyses of variance were used with repeated measures to study associations of cardiovascular risk factors and daytime sleepiness according to the change in shift systems.

RESULTS: The mean number of days on which the workers reported sleepiness decreased in the group with the forward-rotating shift system when compared with that of the group on the old shift system (from 2.9 to 2.1 days/week, $P=0.02$). Systolic blood pressure decreased (from 142 to 136 mm Hg, $P=0.049$), and heart rate showed a declining trend (from 66 to 60 beats/minute, $P=0.06$) in the flexible shift system when the three groups were compared.

CONCLUSIONS: The study indicates that a faster speed, together with a change to the forward direction, in shift rotation alleviates daytime sleepiness. Combining individual flexibility with company-based flexibility in a shift system may have favorable effects on shift workers' blood pressure.

The association of shift work and hypertension among male factory workers in Kota Bharu, Kelantan, Malaysia.

Nazri SM, Tengku MA, Winn T. Department of Community Medicine, Universiti Sains Malaysia, Kelantan, Malaysia. *drnazri@kb.usm.my*

Southeast Asian J Trop Med Public Health. 2008 Jan;39(1):176-83.

Shift work associated with various health problems and there is concern that shift workers are at higher risk to develop hypertension. A cross-sectional study was conducted from December 2003 to May 2004 to compare the prevalence of hypertension and to examine the relationship between shift work and hypertension among 148 randomly selected male workers from one of the factories in Kota Bharu, Kelantan. Information on psychosocial and life-style factors, anthropometric and blood pressure measurements, and fasting blood sugar and lipid profiles analyses were obtained. The prevalence of hypertension was significantly higher among shift workers (22.4%) compared to day workers (4.2%), with p -value of 0.001. **Shift work was significantly associated with hypertension** (adjusted odds ratio 9.1; 95% CI 1.4-56.7).