

## Shiftwork

# 1193 NIGHT-SHIFTS, DNA METHYLATION AND TELOMERE LENGTH: PRELIMINARY RESULTS FROM A SURVEY ON A SAMPLE OF ITALIAN NURSES

<sup>1</sup>M Carugno\*, <sup>2</sup>E Crespi, <sup>1</sup>V Bollati, <sup>1</sup>L Tarantini, <sup>1</sup>L Dioni, <sup>3</sup>D Consonni, <sup>2</sup>C Maggioni, <sup>2,3</sup>G Costa, <sup>1,3</sup>AC Pesatori. <sup>1</sup>EPIGET Lab, Dept. Clinical Sciences and Community Health, Università degli Studi di Milano, Milan, Italy; <sup>2</sup>Dept. Clinical Sciences and Community Health, Università degli Studi di Milano, Milan, Italy; <sup>3</sup>Occupational Medicine Unit, Fondazione IRCCS Ca' Granda – Ospedale Maggiore Policlinico, Milan, Italy

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**Introduction** IARC defined shift work as probably carcinogenic to humans (Group 2A), after investigations highlighted an increased breast cancer risk in night-shift female workers. The biological mechanisms underlying this association are still unclear. Hence, we evaluated the relationship between night-shift work and molecular alterations potentially related to increased cancer risk, in detail: DNA methylation of the oestrogen receptor gene (ER-Beta) and tumour suppressor genes (BRCA1, p53, p16), global DNA methylation estimated in repeated elements (LINE-1, Alu) and telomere length (TL).

**Methods** 46 female nurses (age: 35–45 years) who had been working in night-shifts for at least two years (length of service  $\geq$  five years) were recruited at the Policlinico Hospital (Milan, Italy) and matched for age, sex and length of service to 51 colleagues not working in night-shifts. Each subject was administered a structured questionnaire and withdrawn a 12 mL blood sample. Linear regression models adjusted for age, BMI, parity, smoking habit and oral contraceptive use were then applied.

**Results** Working in night-shifts (yes/no) was associated with BRCA1 hypomethylation ( $\beta$ :  $-0.512$ , 95% CI:  $-1.039$  to  $0.015$ ). When considering also former night-shift workers, the number of years in night-shifts (NYNS) was associated with hypomethylation of BRCA1 ( $\beta$ :  $-0.084$ , 95% CI:  $-0.127$  to  $-0.042$ ), p53 ( $\beta$ :  $-0.072$ , 95% CI:  $-0.133$  to  $-0.011$ ) and LINE-1 ( $\beta$ :  $-0.043$ , 95% CI:  $-0.083$  to  $-0.002$ ). After graphically inspecting the NYNS-TL relationship, we stratified our study population by NYNS  $<15$  vs  $\geq 15$  years. Among nurses with NYNS  $\geq 15$  years, NYNS was associated with telomere shortening ( $\beta$ :  $-0.065$ , 95% CI:  $-0.122$  to  $-0.008$ ) and hypermethylation of BRCA1, p53 and LINE-1.

**Conclusion** Our results show epigenetic alterations that might play a role in cellular ageing, genomic instability and carcinogenesis. We are currently extending our study to other molecular targets involved in the cascade of events that might bring from night-shift exposure to cancer.

# 1252 LONG WEEKLY WORKING HOURS AND RISK OF ISCHAEMIC HEART DISEASE AND STROKE

<sup>1</sup>Ann Dyreborg Larsen\*, <sup>1</sup>Harald Hannerz, <sup>2</sup>Karen Albertsen, <sup>3</sup>Hermann Burr, <sup>4</sup>Martin Lindhardt Nielsen, <sup>5</sup>Jan Hylt Petersen, <sup>1,6</sup>Anne Helene Garde. <sup>1</sup>National Research Centre for the Working Environment, Copenhagen, Denmark; <sup>2</sup>Team Working Life, Copenhagen, Denmark; <sup>3</sup>National Institute of Occupational Safety and Health, Berlin, Germany; <sup>4</sup>Lægekonsulent.dk, Ballerup, Denmark; <sup>5</sup>Danish Centre of Applied Social Science, Copenhagen, Denmark; <sup>6</sup>Department of Public Health, University of Copenhagen, Denmark

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**Introduction** Studies have indicated that long working hours is associated with circulatory diseases. The aim of the present studies was to test if long working hours were prospectively associated with ischaemic heart disease (IHD), usage of antihypertensive drugs (AD) and stroke, in a large randomly selected sample from the general workforce of Denmark.

**Methods** Self-reported data on weekly working hours from the Danish Labour Force Survey (1999–2013) was linked to national registers. Participants were followed until becoming a case, emigration/dead due other causes or end of study period (2014).

Poisson regression was used to analyse incidence rates as a function of weekly working hours. The analyses were controlled for calendar time, time since start of follow-up, age, sex, SES, night and health care work (the latter two for IHD only).

**Result** Around 1 45 000 persons were included with 3635 cases of IHD, 20 648 cases of AD and 1737 cases of stroke. With 32–40 hours/week serving as reference, the estimated rate ratios for IHD were 0.95 (95% CI: 0.85–1.06) for 41–48 and 1.07 (0.94–1.21) for  $>48$  hours/week. The corresponding rate ratios for AD were 0.99 (0.95–1.04) and 1.02 (0.97–1.08).

In the study of stroke 35–40 working hours/week served as reference. The estimated rate ratios for overall stroke were 0.97 (95% CI: 0.83–1.13) for 41–48, 1.10 (0.86–1.39) for 49–54, and 0.89 (0.69–1.16) for  $\geq 55$  hours/week. The estimated rate ratios per one category increase in working hours were 0.99 (0.93–1.06) for overall stroke, 0.96 (0.88–1.05) for ischaemic stroke and 1.15 (1.02–1.31) for haemorrhagic stroke.

**Discussion** The analyses cannot confirm long working hours to be associated with IHD, AD or overall stroke. Data suggest however, that long working hours might be associated with increased rates of haemorrhagic stroke.

# 1426 CLOCKWISE AND COUNTER-CLOCKWISE JOB SHIFT ROTATION DIFFERENTLY IMPACTS ON WORK-LIFE BALANCE

<sup>1</sup>Maura Minonzio, <sup>1</sup>Dana Alon Shiffer, <sup>2</sup>Mattia Bertola, <sup>1,3</sup>Franca Dipaola, <sup>1,3</sup>Enrico Brunetta, <sup>4</sup>Antonio Roberto Zamuner, <sup>1,3</sup>Raffaello Furlan, <sup>1,3</sup>Franca Barbic\*. <sup>1</sup>Internal Medicine, Humanitas Research Hospital, Rozzano, Italy; <sup>2</sup>Surgery Department, Borgomanero Hospital, ASL Novara, Italy; <sup>3</sup>Department of Biomedical Sciences Humanitas University, Rozzano, Italy; <sup>4</sup>Department of Physical Therapy, Universidade do Sagrado Coração, Bauri, Brazil

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**Introduction** Rapidly rotating shiftwork schedule, is common in hospital nurses as it provides continuity to the patients' care. It has been suggested that shift rotation in clockwise (CW) direction produces less disruption of circadian rhythms than counterclockwise (CCW) rotation. Little is known about the effects of different direction of shift rotation on work-life balance, particularly in women characterised by additional commitments and responsibilities in the home and outside of work.

**Aim** To evaluate if CW and CCW shift rotation differently impacts on family and social relationships in female nurses.

**Methods** One hundred healthy hospital nurses (F, 20–50 years) were enrolled. Fifty of them worked in CW (Morning, M; Afternoon, A; Night, N; two rest days) and 50 in CCW (A, M, M, N, three rest days) shift rotation direction. A daily