Invited

Cancer

0503 INVITED KEYNOTE: OCCUPATIONAL CANCER THE 21ST CENTURY

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Occupational health research has identified numerous carcinogens particularly before the 1990s. Most occupational carcinogens were first identified through clinical observations and epidemiological studies rather than experimental studies. The most frequently quoted estimate of cancers due to workplace exposures is 4% and was estimated nearly 40 years earlier. There is a lack of current valid estimates at a global scale. There are significant trends in exposure to occupational carcinogens with a reduction of exposed workers and exposure levels in high income countries and increase in prevalence and high exposure levels in newly developed countries. New technologies and changing employment patterns are posing new challenges in the identification and control of occupational carcinogens. Working time and particularly shift work are among the major new areas for research and prevention. Epidemiological research in recent years has had significant difficulties in providing strong evidences on new carcinogens. This has been particularly the case in complex exposure scenarios such as exposure to pesticides. Different phases in epidemiological research can be identified. Case series and later SMR studies dominated in early periods. These were followed by the development of advanced exposure assessment methods and JEMs and their application in both cohort and case-control studies. In recent years studies in the wider area of molecular epidemiology have developed incorporating mechanistic information. Overall, the most productive studies in identifying carcinogens were the early and relative simple SMR studies that were done in a context of high exposures and limited work mobility. Use of classical epidemiological designs and particularly large cohort studies with advanced exposure assessment methods and the combination with new research approaches using powerful tools for exposure assessment, biomarkers and omic technologies will provide new evidence and allow quantitative risk assessment. Conduct of 'big data' type studies without advanced exposure assessment methods are unlikely to identify new occupational carcinogens. Occupational cancer research has been seriously underfunded and has been inefficient in promoting prevention of occupational carcinogens globally. This is a consequence of factors both within the occupational health community (repetitive non-innovative research; lack of efficient coordination in the occupational health community) but mostly due to wider factors and particularly the general hostile wider political environment concerning work conditions. Occupational exposure to carcinogens continues being in the 21st century a major cause of preventable disease and in many parts of the world the prevalence of these exposures is increasing.

0139 MORTALITY AND MESOTHELIOMA INCIDENCE AMONG CHRYSOTILE ASBESTOS MINERS IN BALANGERO, ITALY: A COHORT STUDY

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Chrysotile asbestos causes an increased risk of mesothelioma (MM), but the extent of this risk and the carcinogenic potency of chrysotile fibers is in discussion. We studied mortality and MM incidence among workers employed at the Balangero mine (Italy), the largest chrysotile mine in Western Europe, active from 1917 to 1985. The cohort included 974 male workers employed for at least 6 months and active on January 1st, 1946 or subsequently hired. Vital status and causes of death were ascertained. Past exposure to asbestos by working area and calendar period was estimated, based on historical measurements of fibre concentrations, and individual cumulative exposure was assessed by applying these estimates to the job history of cohort members.

Local reference rates were used to compute expected deaths from selected diseases and expected incident MM cases. Observed to expected ratios were calculated along with 95% confidence intervals.

Mortality was increased for all causes (SMR=1.28; CI95% 1.17–1.40), pleural cancer (SMR=4.30; CI95% 1.58–9.37) and asbestosis (SMR=375.06; CI95% 262.68–519.23). SMRs for lung cancer (SMR=1.14; CI95% 0.81–1.55) and peritoneal cancer (SMR=3.25; CI95% 0.39–11.75) showed a non-statistically significant increase. Six cases of pleural MM were observed and the SIR was 6.3 (CI95% 2.3–13.7). The analysis by duration and latency for pleural cancer showed an increased risk with increasing duration of exposure and the risk flattened out for latency greater than 40 years. Further analyses based on quantitative exposure indices are being conducted to contribute to the debate on chrysotile potency.

Oral Presentation

Intervention studies

0021 EXERCISE PROTECTS AGAINST LOW BACK PAIN: SYSTEMATIC REVIEW AND META-ANALYSIS OF CONTROLLED TRIALS

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Background The effect of exercise to prevent low back pain (LBP) and associated disability is uncertain. We carried out a meta-analysis to address this question.
Methods Literature searches were conducted in PubMed, Embase, Cochrane Library, Google Scholar, and Research Gate from their inception through September 2016. Randomized controlled trials (RCT) and clinical controlled trials (CCT) were eligible for inclusion in the review if they compared an exercise intervention with usual daily activities and at least some of the participants were free from LBP at baseline.
Results Sixteen controlled trials including 13 RCTs and 3 CCTs qualified for meta-analyses. Exercise alone reduced the risk of LBP by 33% (risk ratio (RR)=0.67, CI: 0.53 to 0.85, I^2=23%, 8 RCTs, N=1634) and exercise combined with education by 27% (RR=0.73, CI: 0.59 to 0.91, I^2=6%, 6 trials, N=1381). The severity of LBP and disability due to LBP were also lower in the exercise than control groups. Moreover, results were not changed by excluding the CCTs, or by adjustment for publication bias. There were few trials on healthcare consultation or sick leave for LBP, and meta-analyses of these trials did not show statistically significant protective effects of exercise.
Conclusions Exercise reduces the risk of LBP and associated disability, and a combination of strengthening with either stretching or aerobic exercises performed 2–3 times/week can reasonably be recommended for prevention of LBP in the general population. However, education about back disorders, ergonomic principles or exercise effects appears to have no additional beneficial effect on LBP.
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Poster Presentation
Musculoskeletal

0057 A NOVEL RISK PREDICTION TOOL FOR DISABILITY PENSION DUE TO MUSCULOSKELETAL DISORDERS

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Background It is important to identify individuals at high risk of work disability and target healthcare interventions at the high risk group. The objective of this study was to develop and validate a novel risk prediction tool using a points system to predict the risk of future disability pension due to musculoskeletal disorders (MSDs).
Methods The development population, the Health 2000 Survey, consisted of a representative sample of employees aged 30–60 years (N=3676) and the validation population, the Helsinki Health Study, consisted of employees of the City of Helsinki aged 40–60 years (N=6391) living in Finland. Both survey data sources were linked to disability pension due to MSDs and mortality data from national registers for 11 years follow-up.
Results The discriminative ability of the model with six predictors was good (Gönen and Heller's K concordance statistic=0.821). We gave easy-to-use points to six predictors: sex-dependent age, high level of education, pain limiting daily activities, multisite musculoskeletal pain, arthritis, and a surgery for a spinal disorder or carpal tunnel syndrome. A score 3 or higher out of 7 (top 30% of the index) had good sensitivity (83%) and specificity (70%). Individuals at the top 30% of the risk index were at 29 (CI: 15–55) times higher risk of disability pension due to MSDs than those at the bottom 40%.
Conclusion This easy-to-use screening tool based on self-reported risk factor profiles can help to identify individuals at high risk for disability pension due to MSDs.

Poster Presentation
Musculoskeletal

0075 DETERMINANTS OF INTERNATIONAL DIFFERENCES IN THE PREVALENCE OF MULTISITE MUSCULOSKELETAL PAIN IN WORKING POPULATION

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Background The prevalence of disabling regional pain varies widely between countries, even among people with similar jobs. It appears that the factors driving this variation predispose to musculoskeletal pain in general rather than being specific to any one anatomical site. To explore at what age they act, and whether they might be amenable to intervention, we analysed previously collected data from a cross-sectional survey.
Methods Information about musculoskeletal pain and risk factors was elicited at interview from six groups of workers (N=855, response rate 95.4%) defined by the nature of their work (non-manual or manual) and their country of residence and ethnicity (UK white, UK of Indian subcontinental origin and Indian in India). We compared the 12 month prevalence of multisite pain across the six occupational groups with adjustment for potential confounders.
Results Overall, 200 participants (23%) reported pain at ≥3 sites, which was much less frequent in Indian manual and non-manual workers than among white non-manual workers in the UK (adjusted ORs 0.04, 95% CI: 0.01 to 0.2, and 0.2, 95% CI: 0.1 to 0.6). However, rates in UK workers of Indian subcontinental origin were very similar to those in white UK workers. This pattern was maintained when analysis was restricted to participants aged <35 years, and when second and later generation migrants were excluded.
Conclusions Large differences in pain prevalence between the UK and India are attributable to environmentally-determined factors which influence pain at multiple anatomical sites, impact by early in adult life, and act soon after moving from India to the UK.