

1727c

**CASE CONTROL STUDY ON PHTHALATE EXPOSURE AND REPRODUCTIVE HEALTH**

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**Introduction** Phthalates are plasticizing agents present in different production cycles (plastics, rubber, paints, cosmetics), some of them have shown toxicity for reproduction. Infertility is a pathological condition with multifactorial aetiology, where exposure to chemicals can be an important component.

**Methods** It was conducted a case/control study by recruiting 172 couples within a centre for assisted fertilisation, to which were collected urine samples and was administered a questionnaire to frame clinical anamnesis, habits and styles life. The sample dropped to 87 women and 76 men, excluding those who had a diagnosis unrelated to potential exposure to xenoestrogens. The determination of urinary metabolites was conducted through the use of HPLC/MS/MS; for diethylhexylphthalate

(DEHP) were monitored: mono (2ethylhexyl)-phthalate (MEHP) and mono(2-ethyl-5-hidroxyhexyl)-phthalate (MEHHP), for diethylphthalate (DEP) was monitored monoethylphthalate (MEP), for butylbenzylphthalate (BBzP) was monitored monobenzylphthalate (MBzP), for di-n-butylphthalate (DnBP) was monitored monobutylphthalate (MnBP). The results obtained were compared with those of 80 men and 90 women with at least one child obtained without hormonal therapy and with a time to pregnancy <12 months, paired by age.

**Results** The average levels of phthalate metabolites ( $\mu\text{g/g creat}$ ) showed, by applying the test of Mann-Whitney, significant difference between cases and controls: for females MBzP 13.4 vs 2.0, MnBP 76.6 vs 3.0, MEHP and MEHHP 34.8 vs 7.2, MEP 569.5 vs 198.0; for males MBzP 16.4 vs 3.4, MnBP 69.8 vs 9.1, MEHP and MEHHP 39.6 vs 9.1, MEP 340.6 vs 135.5. The analysis by the test of Wilcoxon showed that there is a significant difference between males and females (higher) in the values of MEP both between cases than controls.

**Conclusion** The interest in the characterisation of exposure to phthalates is certainly growing and the data obtained indicated a higher level, statistically significant, exposure in subjects with ipofertility. Risk source and clinical significance call for further investigations.

1727d

**WHAT ABOUT PREGNANT WORKERS WHEN THERE ARE CMR SUBSTANCES IN THE WORKPLACE**

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**Introduction** Carcinogenic, mutagenic and reprotoxic substances are often referred to as one group, due to the fact that a substance may present all three types of hazards, but also due to similarities in classification and in legal approach. CMRs are chronically toxic and have serious impacts on health. For workers with a pregnancy wish, pregnant workers and for the breast feeding workers employers should focus on zero

exposure, by for example exemption from work. But if this is not possible a risk assessment is needed.

**Method** Directive 92/85/EEC on safety and health at work of pregnant and breastfeeding workers states that for all activities liable to involve a specific risk of exposure to the agents, processes or working conditions, the employer shall assess the nature, degree and duration of exposure, in order to assess risks to safety/health and possible effect on the pregnancy or breastfeeding workers. This risk assessment should be based on a coherent methodology supported by information collected systematically and measured data. In this presentation, a stepwise approach is presented on how the classification and the risk assessment, can be carried out, and how the assessment can be translated into the decision making process in terms of type and priority of control measures.

**Results** The results will show that mechanism of action of the substances, and studies on which a OEL might have been set (critical studies) are very important, when setting a reliable strategy for risk control. The different ways for exposure assessment will also be presented.

**Discussion** The approach will not only present the possibilities but also the difficulties for employers on dealing with these CMR substances and their workers. Several examples will be shown to illustrate the process and the discussions that might occur.

1727e

**SEMEN QUALITY AMONG WELDERS OCCUPATIONALLY EXPOSED TO LEAD AND CADMIUM IN AN EGYPTIAN SHIPBUILDING FACILITY**

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**Introduction** There is an increase in problems of the reproductive system in human males. This could be due to lifestyle factors, and chemical exposure in the work environment. Occupational activities involve constant exposure to toxic agents and may have a detrimental effect on human reproduction. This study aimed at assessing the semen quality among exposed workers to lead and cadmium.

**Methods** According to the inclusion criteria (at least 2 years of work exposure, age 20–45, non-smokers) 21 male workers (exposed group) in a welding unit at a shipbuilding facility in Ismailia Egypt and 42 office workers (control group) with the same criteria were compared. Personal, medical, reproductive and occupational histories were taken. Blood lead and cadmium concentrations were determined by atomic absorption spectrophotometer with Zeeman background correction (Perkin Elmer). Analysis of semen samples was performed in accordance with World Health Organisation criteria. P-value less than 0.05 were considered statistically significant in data analysis.

**Results** The blood level of lead and cadmium for the welding workers was  $45.75 \pm 9.78 \mu\text{g/dl}$  and  $1.68 \pm 1.60$ , respectively, which was significantly higher than the control group  $12.65 \pm 3.78$  and  $0.15 \pm 0.22$  ( $p < 0.001$ ). Sperm counts of welding workers were  $31.12 \pm 22.97$  millions/ml lower than those of the control group were  $50.80 \pm 39.56$  millions/ml ( $p = 0.016$ ) and also sperm motility was decreased in exposed workers compared to controls ( $p = 0.003$ ). The sperm motility showed a negative correlation with blood lead content in workers. Blood concentration correlated with the number of years of exposure to welding.

**Conclusion** This study shows that exposure to lead and cadmium may affect semen profile in male welding workers. Further studies are needed to control for other potential confounding factors, and environmental assessment should be done to assess exposure pathways and concentration.

**1727f KNOWLEDGE ABOUT ADVERSE EFFECTS OF WORKING CONDITIONS MUST BE USED IN COUNSELLING BEFORE CONCEPTION AND DURING EARLY PREGNANCY**

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To find and use scientific evidence about the influence of working conditions on reproductive outcomes for practical use in a guideline for occupational and a website for pregnant women, parents to be, health care professionals and policy makers. We searched the literature for evidence concerning the effects of working conditions before, and during pregnancy on pregnancy outcome and development during early childhood. The working conditions with effects on pregnancy outcome were summarised in six groups: physically or mentally heavy work, shift work, chemical substances, physical factors (like noise) and infections. We looked at the following pregnancy outcomes spontaneous abortions, preterm birth, low birth weight, hypertension and congenital malformations and learning problems at early school age. Use of evidence: A practical guideline<sup>1</sup> was made for occupational physicians in The Netherlands (also translated in English). It can be used by physicians in advising pregnant women and women breastfeeding their child. In another report 'Preconception care: a good beginning',<sup>2</sup> the chapter about working conditions underlines the effect of exposure before conception on the embryo and fetus. In the third place the evidence was used on websites<sup>3,4</sup> for parents to be or pregnant women and can be used for preventive measures regarding working conditions preconceptionally or during pregnancy. There is growing evidence that working conditions before and during pregnancy can increase the number and severity of pregnancy complications. There is also evidence that early intervention can prevent this increase of pregnancy complications. The available evidence has been used for a guideline for occupational physicians and on a website for parents to be in order to take preventive measures. A summary of the evidence will be presented together with examples how to use the evidence in counselling before conception and during early pregnancy.

**1727g INCREASED RISKS OF CHILDHOOD CANCER AND INFANT DEATH IN THE OFFSPRING OF ELECTRONIC WORKERS**

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In 1994, a hazardous waste site, polluted by the dumping of solvents from a former factory, was discovered in Taoyuan, Taiwan. The factory was built in 1970, and was in operation for the manufacturing of electronic appliances up until 1992. The objective of the study was to investigate the risks of childhood cancer and infant death in the offspring of electronic workers. We linked the databases of labour insurance, birth registration, and national cancer registry, which identified 40 647 female workers ever employed in this factory who gave 40 647 first live born singletons, and 47 of them developed cancers during 1979–2001. We also linked the databases of labour insurance, birth registration, and national death registry, identified 7202 male workers ever employed in this factory with 13 592 live born children and 81 deaths in the first year after, excluding 861 children with potential maternal exposure from the same workplace.

We demonstrated evidence on the hypotheses that maternal exposure to organic solvents near conception increases the risk of cancer in offspring and that paternal exposure during preconception relates to infant mortality and deaths due to congenital malformation.

## Respiratory Disorders

**1037 A CROSS-SECTIONAL STUDY TO VALIDATE A SCREENING QUESTIONNAIRE TO DETERMINE PREVALENCE OF WORK-RELATED ASTHMA IN PRIMARY HEALTH CARE IN CHILE**

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**Introduction** The attributable population risk of work-related asthma is between 10% and 20% of total cases of asthma. In Chile, the prevalence of common asthma is 10.2% but the proportion of occupational asthma (OA) is hidden and invisible. The study objective was to determine the prevalence of OA among asthmatic patients in regular control in the Primary Health Care (PHC) adult respiratory diseases program in Santiago, Chile.

**Methods** A descriptive, cross-sectional multicenter study of patients aged 20 to 64 years with diagnosis of asthma, according to medical records and functional respiratory tests; who were working or had worked and were in control in PHC in a healthcare district of Santiago. An Occupational Asthma Screening Questionnaire (OAS) was developed and validated in four PHC centres to identify occupational asthma in the population in control for bronchial asthma. The screening instrument included six questions with a scale from 6 to 16 points. The instrument was prepared with a panel of experts with validation of feasibility, reliability, logic, content, construct and criteria, using confirmatory diagnostic tests and blind medical evaluation by two specialists in respiratory diseases and occupational medicine as the gold standard. Patients were classified into three categories: OA, work-exacerbated asthma WEA or common asthma (CA), according to OAS and the medical evaluation.