Introduction The organophosphates (OPs) are a group of insecticides that have been widely used worldwide for the past 50 years. It is estimated that 3,000,000 people are exposed to OPs yearly, with the associated death rate being 3,00,000 deaths/year. OPs are cholinergic inhibitors and their toxicity is possible through acute or chronic exposure, with severe consequences for different organs and systems. The main objective of this study was to identify signs and symptoms of exposure to OPs on women with chronic exposure.

Methods A prospective study (1994–2014) followed up 43 women exposed to OPs, and evaluated signs and symptoms described as being associated to OPs exposure, as well as analytical parameters associated to asthenia and cellular protection, namely pyruvate (PA) and lactate (LA).

Results During the first appointment, 98% of the women had asthenia. Among the evaluated signs and symptoms, musculoskeletal injuries (78%) and menstrual cycle changes (36%) occurred with the highest frequency. Slightly less frequent were the changes observed in the peripheral nervous system (11%). Regarding the evaluated biochemical parameters, women generally showed a decrease in ferritin and an increase in TSH. Throughout the study a progressive drop in AChE was observed. In 64% and 92% of the women a change in PA and LA values respectively was observed.

Discussion The results suggest that prolonged exposure to OPs can chronically affect different human organism systems, namely parameters related to mitochondrial dysfunction

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DERMAL EXPOSURE TO DIISOCYANATES: DEVELOPMENT AND VALIDATION OF AN ANALYTICAL METHOD FOR ACCURATELY ASSESSMENT OF VERY LOW LEVELS OF EXPOSURE

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Introduction Dermal exposure to sensitizers such as diisocyanate have been described to promote the development of asthma in later stages when respiratory occupational exposure occurs. Therefore, we developed a reliable, sensitive and validated methodology based on dermal patches to assess skin exposure to diisocyanates.

Methods An UPLC-Unispray-MS/MS method was established and validated in order to reach very low levels of detection. Custom-made dermal patches were developed in order to allow optimal sampling of diisocyanates. Their sampling capability was evaluated in a controlled environment test-chamber where patches were exposed to increasing concentrations of diisocyanates.

Result The UPLC-MS/MS method using a Unispray ionisation source, based on supercritical fluids ionisation and Coanda effect, allowed reaching very low levels of detection (LoD=1 pg/mL) for all the targeted compounds (i.e. 4,4-MDI, 2,4-MDI, 2,6-TDI, 2,4-TDI, 1,6-HDI, and IPDI). Due to the high sensitivity of the analytical method, very low levels of diisocyanates (i.e. 25 pg/patch) are detected on the custom-made dermal patches. Furthermore, the patches allowed the sampling of a broad range of concentration levels (from 5 pg/cm² to 5 ng/cm²), which have been correlated with the air levels from the controlled environment chamber-test.

Discussion We succeeded to develop a method to assess dermal exposure to diisocyanates. Field studies are now necessary to further evaluate the suitability of the custom-made patches, as well as to relate low levels of exposure and potential health outcomes.

Primary Care and Work

1701

SCALING UP WORKERS' HEALTH COVERAGE THROUGH PRIMARY HEALTH CARE

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Aim To explore ways of upskilling primary health care to offer essential occupational health to a broader population; some country examples.

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1701a

GLOBAL BACKGROUND OF INSUFFICIENT COVERAGE BY OCCUPATIONAL HEALTH SERVICES: WHAT CAN WE DO TO SUPPORT PREVENTION AND CARE

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Background According to latest estimates by ILO 2.8 million men and women die every year caused by problems at work. Health disorders cause 2.4 million deaths. Costs are 3.9% of the global GDP or 3 trillion (million millions) USD. Problems include: poor legal and enforcement coverage, poor or no workers' compensation systems, poor or no occupational health services – some 15% or less of the global workforce is covered. According to WHO 93% of global health resources go for treatment and 7% for prevention. Lack of knowledge, policies, systems and resources is evident.

Methods and processes A number of solutions and good practices have been identified to be useful and successful, although largely in developed countries. Simple methods to increase coverages and enhance services are needed. The ILO

Convention 161 on 'Occupational Health Services' provides tools to qualify and quantify occupational health services which are 'entrusted with essentially preventive functions'.

Results The present coverage of services globally is presented and essential components of present practices are highlighted. Countries that have properly established services tend to have healthier workforce, lower number of problems, illnesses and injuries at work. The Public Health Care system and family doctors can significantly contribute to such occupational health services while they need access to knowledge, training and contacts with workplace problems. Basic Occupational Health Services can be established.

Conclusion The immediate reaction to problems caused by exposures to various risks at work is often first aid and treatment and usually just limited to that. There is a need to have a new focus and attention on the diagnosis, reporting and other proactive functions by health staff, including public health doctors, nurses or family doctors.

1701b MISSION IAOH-BOHS: OCCUPATIONAL HEALTH SERVICE DELIVERY FOR INFORMAL SECTOR WORKERS THROUGH PRIMARY CARE ECOSYSTEM

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Over 400 million informal workers in India are deprived of organised occupational health care services. Challenges of dysfunctional occupational health care for such a large unorganised workforce stimulated the Indian Association of Occupational Health (IAOH) to launch *Mission BOHS* incorporating the concept of Universal Health Coverage and BOHS strategies of WHO, ILO, WONCA and ICOH. Considering the serious lacunae in availability of trained human resources in this field, training of primary care professionals in OH assumed particular significance both, in terms of its reach, and accessibility. A Task Force was appointed to study profile, size, characteristics of work and occupational health risks of leading 22 informal industries. The target audience for capacity building identified were Medical Officers of Primary Health Centres (PHC), Employees' State Insurance Hospitals and Family Physicians. Next step involved the creation and publication of 'Basic Occupational Health Services for Informal Industry: Manual for Primary Care Providers' in print and ebook versions. This manual was converted into audiovisual format for training videos screened via satellite for PHC staff during monthly district meetings. Free downloads of ebook were offered on IAOH website, as contact seminars were found to be less effective and more expensive. Pilot BOHS project has been launched in one state subsequently, followed by appointment of BOHS Missionaries across major states to advocate knowledge, attitudes and practices relevant to BOHS. The Primary Care ecosystem offers a potential model intervention in OH for the informal sector in developing countries. Mission BOHS, is work in progress and is expected to penetrate deeper with collaborations between IAOH and Central Labour Institute, Director General of Factories, Labour Advisory Service, Indian Institute of Public Health.

1701c DEVELOPMENT OF OCCUPATIONAL ILLNESSES AND INJURIES RECOGNISING AND RECORD KEEPING TO STRENGTHEN OCCUPATIONAL HEALTH SERVICES DELIVERY AMONG PRIMARY CARE UNITS IN THAILAND

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Introduction PCUs in Thailand are able to provide some occupational health services activities. Occupational diseases (OD) are difficult to diagnose for several reasons:

- the similarities in the clinical presentation and pathophysiology between occupational and non-occupational exposures;
- the long latency period between exposure and symptom onset;
- the multifactorial aetiology of many chronic diseases; and
- no data of work-related conditions. If PCUs could provide OD diagnosis, patients with suspected OD will be benefit from referral to an occupational medicine specialist for a more detailed assessment, under-report of OD and risk from work will be managed. This study aimed to develop OD recognising and record system to strengthen OHS data system.

Methods The screening questions were developed to identify potential occupational causes of symptoms. Meanwhile, Bureau of Occupational and Environmental Diseases has collaborated with the Health Data Centre (HDC) of the Ministry of Public Health to add the 14 common OD in the data system. PCUs were recommended to use such screening questions, provide OD diagnosis and record in the data system.

Results Screening questions include what kind of job patients have; whether their symptoms are worse at work; whether they are or have been exposed to dust, fumes, chemicals, or loud noise; whether their colleagues have similar symptoms and whether they think their health problems may be related to their works. Currently, 2031 (20.78%) of total PCUs could use such questions to identify OD and add external cause ICD-10 code (Y96) to the record system. All data link to HDC therefore the national and local agencies could access OD statistics through HDC.

Conclusion Such screening questions are very useful and important for PCUs, especially when the diagnosis or aetiology is in doubt. Occupational health services among PCUs should be strengthened to obtain the quality data.

1701d UNIVERSAL HEALTH COVERAGE AND WORKERS' HEALTH DEVELOPMENTS IN INDONESIA

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Introduction The social and health Insurance or universal health coverage for the Indonesian is BPJS. BPJS stands for *Badan Penyelenggara Jaminan Sosial* or The Social Security Organisation Body. The Indonesian army, police, civil employees, assistance recipients (PBI), and citizens in general are mandated to register with *BPJS Kesehatan* while the private company employees and expatriates who work in Indonesia