

---

## Selected Toxicology-Related Abstracts

---

### Citation

. *Selected Toxicology-Related Abstracts*. The Internet Journal of Toxicology. 2004 Volume 2 Number 2.

### Abstract

First International Environmental Health Conference,  
HEALTH AND THE ENVIRONMENT IN IRAQ:  
Status, Needs & Challenges  
Amman, Jordan, September 19-22, 2005

Sponsored by Stony Brook University and the Agency for  
International Development,  
Higher Education and Development.

Program Director Prof. Dr. Wajdy Hailoo, Stony Brook  
University, NY.

### **NEURAL TUBE DEFECTS AMONG INFANTS DELIVERED OF MOTHERS WITH TOBACCO SMOKE EXPOSURE**

A. A. Mahmood

Kufa College of Medicine, Kufa, Iraq

Goals and Objectives: Verify the incidence of neural tube defects (Anencephaly /meningomyelocele) among infants delivered of the pregnant mother who had prenatal history of tobacco smoke exposure and to test the association between such variables in Najaf governorate, Iraq.

Design: A cross sectional Study on Pregnant women who were delivered at maternity hospital. The sample was subdivided into exposed and unexposed women to tobacco smoke.

Methods: A systematic random sample of pregnant women who attended the major maternity and children hospital in Najaf city during the period 2002-2004. A sample of 2300 delivered women were selected and interviewed for history of indoor smoking exposure whether they were heavy smokers or passively exposed from their heavily smoking husbands in addition to taking folic acid tablets before and during pregnancy .They were adjusted for dietary folate deficiency and other confounders which may be attributable to congenital anomalies development. The newborns were clinically examined by a pediatrician for presence of any congenital anomalies especially neural tube defects.

Results: The over all newly delivered newborns within the period of study with congenital anomalies were 3.4% (including small defects). The most frequent neural tube defects were spina bifida (1.2% ) and anencephaly ( 1.8% ) among those who were heavily exposed to smoking versus 0.6% and 0.8% respectively among non smokers and passively unexposed women ( $P<0.05$ ) .

98% of mothers did not have previous delivery of such defect. There was no significant difference in the incidence of congenital anomalies between those who took folic acid tablets and those who did not Neither between those women who live in urban or rural areas or between different age groups for neural tube defects.

Conclusion: There was an increase in the incidence of neural tube defects without previous affected siblings among mothers with heavy exposure to tobacco smoke. Folic acid prescription may not prevent the occurrence of these defects among exposed mothers.

### **ASSESSMENT OF PULMONARY FUNCTIONS AMONG COTTON TEXTILE WORKERS IN BAGHDAD**

A. Al-Saidi and W. Al-Tawil

National Center of Occupational Health and Safety, Ministry  
of Labor, Baghdad, Iraq

Goals: Evaluation of health status of Iraqi Textile Workers.

Objectives: To asses the magnitude of respiratory health problems of inhalation cotton dusts by textile workers.

This cross-sectional study covers registered 358 records for the period from Jan.30th 1996 till Jan.30th 2003 for clinical and spirometry assessment done by National Center of Occupational Health and Safety .Spirometry includes FEV1,FVC and FEV1/FVC percent for each worker.

Statistical Analysis includes percentages, chi –square and Z-test.

Results: Out of 358 employees 56 show abnormal lung function tests (15.64%) and all of them are males. The majority of workers with abnormal lung function tests were from the carding room (67.85%) followed by blowing section (25%) then blending room (5.35%). The majority of workers (98.22%) with abnormal lung function tests have duration of employment of (10-24) years. There is statistically significant association between abnormal lung function tests and long duration of work 15 years of exposure or more.

Out of 56 employees with abnormal lung functions tests, 25 employees are smokers (44.64%). Also 51.95% of abnormal lung functions test (29 employees) have clinical signs and symptoms as classified by international classification. The majority of workers with abnormal pulmonary function tests (83.95%) have obstructive type of ventilatory defect while 12.50% have combined type and two employees with restrictive type only.

Conclusion: Duration of exposure is an important factor in pulmonary function abnormality. Carding and blowing rooms are the mostly affected Sites where exposure occurs. Obstructive lung disorder is the prominent type. The middle age groups are the mostly affected. Smoking is an important factor increasing the severity of pulmonary function impairment.

Recommendation: Periodic Medical Examination. The current clinical evaluation reflects the possibility of the high dust exposure although no available data are found. Therefore abiding to the international standards ( $100\mu\text{m}^3$ ) is recommended. Workers with atopia should be replaced in a relatively dust free areas. Worker's compensation for occupational disability should be available. Technical support to the National Center for Occupational Health and Safety is highly recommended.

### **A STUDY OF MORBIDITY PATTERN WITH SPECIAL REFERENCE TO OCCUPATIONAL ALLERGIC DISEASES AMONG WORKERS OF THE STATE COMPANY OF FERTILIZERS, BASRAH**

A. Al-Yassen and N. Ajeel  
Department of Community Medicine, College of Medicine,  
University of Basrah, Basrah, Iraq

Goals/Objectives: Examine the general morbidity pattern of workers over a specified period of time. Determine the impact of the exposures to hazardous agents in the

workplace with special reference to the development or exacerbation of allergic diseases.

A cross-sectional comparative study was carried out in the state company of fertilizers/southern which is one of the important companies in Iraq. This research was designed to study the relationship between exposure to gases and dust in the workplace and allergic diseases.

Three exposed groups (workers in ammonia & urea, water refinery, and packing departments) were compared to non-exposed control group (workers in administrative departments). The results showed that the prevalence of work-related allergic conditions as reported by workers and diagnosed by the investigator were significantly higher among the exposed groups than the control group. Similarly, the total serum immunoglobulin E (IgE) levels were significantly higher in the exposed groups than in the control group. A clear significant effect of the degree of exposure to hazardous gases and dust on total serum IgE level was observed. These findings suggested that the risk of work-related allergic diseases was higher among workers exposed to irritant gases and dust than among their controls. The overall results of the present study indicate the need for enhancing occupational health measures with a special attention to preventive and promotional aspects.

### **LEVELS OF POLLUTION BY LEAD IN BASRAH, IRAQ**

A. Al-Saboonchi, A. Al-Marashi and A. Ali  
Department of Fishery, Basrah University, Basrah, Iraq

Goals: Monitor the levels of lead in environment of the south part of Iraq.

Objectives: Assess the lead level in roadside dust and plant leaves in Basrah and detect the lead level in the blood of traffic police.

Levels of lead in dust of road sides, plant leaves and blood from traffic police-men were measured, during summer season, 2004. Dust of road sides were collected from different stations. Extracted with EDTA and levels of it were measured after dilution by atomic absorption spectrophotometer. Dithizon spectrophotometer techniques were used for extraction of lead in leaves of plants and blood. Study concluded that the levels of lead in dust range between (99-416)  $\text{mg/kg}$  while in plant leaves the highest value of (5.15)  $\text{ppm/cm}^2$  near Ashar river and the lowest value (1.09)  $\text{ppm/cm}^2$  at Abu Al-Kassib. In case of blood the highest value of lead (92)  $\text{mg/100 ml}$  found in traffic police-

men with 15 years serves, while the lowest value (15.1) mg\100 ml is recorded in traffic police-men who serve only 7 months.

**HEALTH EFFECTS CAUSED BY LEAD ABSORPTION AMONG BATTERY MANUFACTURING WORKERS IN THE PRIVATE SECTOR IN BAGHDAD IN CONTRIBUTION WITH W.H.O.**

E. A-K. Saber  
National Center of Occupational Health and Safety,  
M.L.S.A, Baghdad, Iraq

Goals: Locate and study the impact of such hazardous industries which were created due to the influence of the new situation our country is living under now a day on the environment and human health.

Objectives: 1) Assess the health effects resulting from lead absorption among workers employed in repairing old damaged liquid batteries in Baghdad city. 2) Determine the impact of this phenomenon on the environment and people residing in the vicinity of such work places.

This survey was carried out on the private reinstalling and repairing workers in small industries and work shops, in comparison to a group of workers in big factories not dealing with lead during their usual daily work, in Baghdad city.

A group of researchers at the N.C.O.H.S. conducted this survey

The survey was carried out aiming to assess the health effect resulting from lead absorption among the battery repairing workers and to determine the impact of this phenomenon on the surrounding environment and people residing in the vicinity of such work places. A modified standardized questionnaire was distributed to all the participants. Blood and urine samples were taken from each participant in addition to air samples collected from work places and inspired by the workers.

All these samples were analyzed for lead content and ALA / Cr in the laboratories of the national center of occupational health and safety (N. C. O. H. S.) in Baghdad. Also the survey studied the environmental conditions of the work places as well as the methods of disposing their liquid waste products. The survey revealed a wide, irregular and unorganized spread of these work places in almost all Baghdad industrial, commercial and even the residential areas. This might to a great deal be the cause of pollution of

the surrounding environment and affect the health of people living in the vicinity of such work places. This can be due to disposing of the liquid disposals directly to the streets, or due to spreading of polluted air with lead fumes to the surrounding environment. Also we noticed increasing complain of the battery repairing workers of signs and symptoms due to increased exposure to high levels of lead, along with high blood lead levels among them in comparison to the control group of workers. However we noticed that blood lead levels among the control group were still elevated above the accepted levels.

**SIMPLE ELECTROMETRIC METHOD FOR DETERMINATION OF BLOOD AND TISSUE CHOLINESTERASE ACTIVITIES IN MAN AND ANIMALS: IMPLICATIONS FOR ENVIRONMENTAL BIOMONITORING**

F. K. Mohammad  
College of Veterinary Medicine, University of Mosul,  
Mosul, Iraq

Goals: Presenting and reviewing a simple modified electrometric method for measurement of blood and tissue cholinesterase in man and animals with possible applications for monitoring exposure to organophosphate and carbamate insecticides.

Objectives:

1. Outlining the electrometric technique for measuring blood and tissue cholinesterase activities.
2. Presenting the specifications and efficiency of the method in measuring cholinesterase activity.
3. Reviewing normal blood or tissue cholinesterase activities determined by the described electrometric method in man and animals.
4. Documented applications of the method for diagnosing organophosphate and carbamate poisoning or exposure.

Measurement of cholinesterase activity is of diagnostic value in cases of organophosphate and carbamate insecticides poisoning. The enzyme is inhibited to various extents with concomitant appearance of signs of cholinergic hyperstimulation. The present report introduces and reviews a simple electrometric technique to measure blood (plasma, erythrocyte and whole blood) or tissue (brain, liver and

muscle) cholinesterase activities in animals as well as to measure blood cholinesterase activities in man. Typically, the procedure involves the addition of 0.2 ml of blood sample or tissue homogenate to 3 ml of distilled water followed by 3 ml of barbital-phosphate buffer solution (pH 8.1). The pH (pH1) of the mixture is measured, and then 0.1 ml of 7.1% of acetylcholine iodide or 7.5% acetylthiocholine iodide, as a substrate, is added. The reaction mixture is incubated at 37 °C for 20-40 minutes according to the animal species. The pH (pH2) of the reaction mixture is measured after the end of the incubation period. The enzyme activity is expressed as  $\Delta \text{pH} / \text{incubation time} = \text{pH1} - \text{pH2} - (\Delta \text{pH of the blank})$ . The blank is without the enzyme source. Literature are cited regarding the expected normal cholinesterase activities as the method was proved to be efficient, simple, accurate and reproducible for possible monitoring of exposure to organophosphate or carbamate insecticides in man and in several animal species such as mice, rats, sheep, goats, cattle, chickens and wild birds.

### **PEROXIDATION OF LIPOSOMES IN THE PRESENCE OF URANYL ION AND ASCORBIC ACID**

G. D. Lawrence and Y. Chen

Department of Chemistry and Biochemistry, Long Island University, Brooklyn, NY 11201

Goals: Determine whether uranyl ion will induce lipid peroxidation (LPO).

Objectives: Study the conditions that result in uranyl-induced lipid peroxidation and to determine which factors can influence uranyl-induced lipid peroxidation.

Uranium contamination from exposure to fine (submicron) particles of uranium oxides, resulting from the use of depleted uranium munitions in combat, places combat personnel, as well as civilians in areas where uranium munitions have been used, at risk of uranium poisoning. A key feature of uranium poisoning is kidney failure, resulting from destruction of renal tubular epithelial cells. Although malondialdehyde, a marker for lipid peroxidation, may be elevated in plasma after uranyl treatment, studies have failed to show lipid peroxidation in kidney tissue or in kidney cells in culture following uranyl treatment. A study was undertaken to determine whether uranyl ion would catalyze lipid peroxidation in liposomes prepared from lecithin. Initial results indicated that uranyl would not catalyze peroxidation of liposomes at neutral pH, but seemed to catalyze lipid peroxidation under more acidic conditions that

might prevail in the renal proximal tubules. The peroxidation reaction was suppressed by addition of citrate to the medium, which suggested a mechanism for the protective of citrate on uranyl-induced kidney failure. However, it was later discovered that traces of iron in the purified water used in these experiments was likely accounting for the catalytic activity observed. This presentation will give an overview of routes for uranium exposure in contaminated areas and current understanding regarding the biochemical processes that might explain uranium toxicity.

### **LEAD BLOOD LEVEL AMONG CHILDREN IN AL-ANBAR GOVERNORATE, IRAQ**

J. K. Al-Diwan, A. M. H. Al-Hamawandi and F. J. Ali  
Al-Anbar University, Iraq

Goals: Study the prevalence of lead poisoning in children.

Objectives (minimum 2-3): 1) Assess blood lead levels in children. 2) Assess the effects of lead toxicity in children.

Background: Several cases with lead poisoning were admitted to Al-Anbar maternity and children hospital during the last decades. This study was carried out, therefore, to study lead poisoning among children in Al-Anbar governorate.

Materials and Methods: Two districts (Al-Hatba and Al-Matheeque) were included in the study. 128 blood samples were collected from children and their mothers. 44 samples from water, soil and kuhil were also taken. Lead level was estimated in the samples.

Results: Lead toxicity was noticed in 93.8% and 100% of children from Al-Hathba and Al-Matheeque, respectively. Age of children was significantly associated with lead blood levels. Water lead content was significantly associated with blood lead levels. Pica also, was associated with blood lead levels.

Conclusion: There is a high prevalence of lead toxicity among children in Al-Anbar governorate.

### **FLUORIDE ION IN DRINKING WATER AND ITS EFFECT ON ORAL HEALTH**

L. A-K. Alazzawi

College of Dentistry, University of Baghdad, Baghdad, Iraq

Goals: Maintenance of dental health by the use of Fluoride ion.

Objectives: 1) National survey was conducted for the

investigation of fluoride ion in drinking water. 2) Relation of fluoride ion to dental caries dental fluorosis among 5 and 15 years old children.

The most feasible way to prevent dental caries is to increase the teeth resistance to decay and the best individual and public health defense against dental decay is the proper use of fluorides

**Material and Methods:** The sample size of the study included 4695 students at 15 years of age. They were selected from six governorates in Baghdad, Ninevah, Basrah, Anbar, Diyala, and Kerbala. It was decided to take almost equal sample size from urban, periurban and rural areas. In the urban areas 4 sites were chosen, while for 2 sites in each 2 large towns and 4 sites in each 4 villages in different regions (WHO1997) permission was obtained from the ministry of education in Iraq. The school authorities were contacted to ensure full cooperation. Fluorides samples of drinking water

were collected from each site using clean polyethylene bottles. 25-30 ml analysis of water was done according to electrodes of water ion (Digital ion activity meter). Plain mouth mirrors were used for examination along with probes. Dental caries was measured using DMFS (WHO 97) The mean decay M missing due to caries F tooth with permanent filling. Dental fluorosis lesions are usually bilaterally symmetrical and tend to show a horizontal striated pattern across the tooth (WHO1997)

**Results:** Urban students included 933 males and 891 females, periurban 739 males and 785 females and rural 648 Males and 649 Females.

Out of 4695 students, 30.46% were found to be caries free (27.30% urban 31.63% periurban and 33.4% rural) using Z test. There was a statistically significant difference between urban, periurban students ( $p < 0.01$ ,  $Z=2.739$ ) and rural students ( $p$