1116 OCCUPATIONAL EXPOSURE TO MERCURY RESULTS IN SERUM AUTOANTIBODIES TO NEUROTYPIC AND GLIOTYPIC PROTEINS. RM El-Gazzar, MY Shamy, I Abdel Moneim and HAN El-Fawal*. Instit. Public Hlth, Univ. Alexandria, Egypt and *Instit. Environ. Med., NYU Med. Center, NY.

An ELISA to measure serum autoantibodies to neurotypic and gliotypic proteins [neurofilament triplet (NF68;NF160;NF200), myelin basic protein (MBP) and glial fibrillary acid protein (GFAP)] as markers of subclinical neurotoxicity was developed and field tested. Male workers exposed to mercury (Hg) at a fluorescent light factory (n=39) and a reference group (R) of workers at a food packing plant (n=39) were studied. Ambient levels of Hg vapor was 0.05 mg/m^3 in the light factory. Mean age, years of exposure and urinary Hg (HgU ug/g creatine)(±SD) for Hg and R, respectively, were: Age: 38(7); 41(7); Yrs Exposed: 13(7); 0; HgU: 11(9)*; 1.9(1). Percent with detectable titers to nervous system proteins in the Hg and R populations, respectively, were: Anti-NF68: 56; 17; Anti-NF160: 60; 15; Anti-NF200: 64; 0; Anti-GFAP: 52; 20; Anti-MBP: 20; 4. HgU was significantly elevated in the Hg population. Autoantibodies predominated in workers exposed to Hg compared to R. Titer profiles are consistent with axonal and astroglial involvement in Hg neurotoxicity. Follow-up neurological examination, 4 months after autoantibody determination, indicated mild sensorimotor deficits, suggesting that autoantibody detection may be predictive of clinical deficits. It is suggested that neurotypic and gliotypic autoantibody determination can be used for early detection of neuropathy at subclinical levels. (Sponsored by NIH Center Grant ES-00260).

1117 AUTOANTIBODIES TO NEUROFILAMENTS (NF), GLIAL FIBRILLARY ACIDIC PROTEIN (GFAP) AND MYELIN BASIC PROTEIN (MBP) IN WORKERS EXPOSED TO LEAD. I Abdel Moneim, MY Shamy, RM El-Gazzar and HAN El-Fawal*. Instit. Public Hlth, Univ. Alexandria, Egypt and *Instit. Environ. Med., NYU Med. Center, NY.

An expanded follow-up assessment of the autoantibody response to neuronal and astroglial autoantigens [NF68; NF160; NF200; MBP; GFAP] as early markers of neurotoxicity was performed in male workers exposed to lead (Pb) at a battery factory (n=50) and a matched reference group (R) of workers at a food packing plant (n=39). Mean age, years of exposure and blood Pb (PbB ug/dl) (±SD) for Pb and R, respectively, were: Age: 39(6); 41(7); Yrs Exposed: 14(6); 0; PbB: 32(11)*; 16(5). Percent with detectable titers to nervous system proteins in the Pb and R populations, respectively, were: Anti-NF68: 59; 17; Anti-NF160: 28; 15; Anti-NF200: 25; 0; Anti-GFAP: 90; 20; Anti- MBP: 16; 4.
Autoantibodies to nervous system proteins predominated in workers occupationally exposed to Pb compared to R. Anti-NF68 and GFAP titers were the most frequently encountered. Anti-NF68 titers were significantly correlated with years of exposure ($r=0.538$, $p<0.0001$) and with PbB ($r=0.325$, $p<0.05$). Furthermore, the number of detectable autoantibody types correlated with clinical scores of sensorimotor deficits ($r=0.459$, $p<0.0001$). This study suggests that autoantibodies provide a promising biomarker of neurotoxicity while providing information on subcellular targets. It also raises concerns of toxicant-induced autoimmune neuropathy.(Sponsored by NIH Center Grant ES-00260).

1118 SERUM AUTOANTIBODY TO NERVOUS SYSTEM PROTEINS: ISOTYPES IN WORKERS EXPOSED TO CADMIUM AND NICKEL. HL Evans, E Taioli, P Toniolo and HAN El-Fawal. Instit. Environ. Med., NYU Med. Center, NY.

Biomarkers of neurotoxicity may help monitor occupational risks associated with exposures to chemicals. The detection of autoantibodies to nervous system structural proteins [neurofilament triplet proteins (NF68; NF160; NF200), myelin basic protein (MBP) and glial fibrillary acidic protein (GFAP)] provides a simple marker of neurotoxicity while providing information on the subcellular targets. We developed an ELISA for antibody isotypes IgM and IgG in sera of workers at a cadmium (Cd)-nickel (Ni) battery factory in Poznan, Poland. Male workers, matched for demographic and socioeconomic status, were divided into 3 groups according to job category and ambient levels of Cd-Ni: High (n=12) and Low (n=5). Administrators (n=10) with little direct contact with either metal were the reference group. Autoantibody levels were higher in groups working with Cd-Ni compared to the reference group. IgM (associated with primary antigen challenge) predominated in the low exposure group while IgG (associated with secondary antigen challenge) predominated in workers having higher exposure, suggesting their longer duration of exposure to autoantigen and thus greater nerve cell damage. Anti-GFAP titers correlated ($r=0.7$) with anti-NF titers, indicating that both neurons and astroglia are affected. Furthermore, anti-NF titers correlated ($r=0.5$) with Cd (a known neurotoxicant) levels but not Ni (a non-neurotoxicant). This study suggests that detection and isotyping of autoantibodies may indicate preclinical stages of neurotoxicity. A study of this population, including behavior, is underway.(ES-04895).

1119 LEAD TREATMENT OF MYELIN BASIC PROTEIN (MBP) ENHANCES THE ANTIGENICITY OF MBP IN CBA/J MICE. S Waterman, CA Snyder and HAN El-Fawal. Instit. Environ. Med., NYU Med. Center, NY.

Environmental pollutants have been suspected of playing a role in the pathogenesis of nervous system autoimmune disease, such as multiple sclerosis (MS). Lead (Pb) is known to impact on both the immune and nervous systems. In the latter, Pb exposure has been shown to result in autoantibody titers to nervous system proteins, including MBP. We hypothesize that Pb aggravates neural autoimmune disease by enhancing the antigenicity of neurotypic proteins, such as MBP. To test this hypothesis, MBP was incubated for 24h with Pb acetate and then passed through a Sephadex column to remove unbound Pb. Mice received 3 inoculations on days 0, 14 and 28 with Saline + Incomplete Freunds Adjuvant (IFA), MBP + IFA, or Pb altered MBP + IFA. Anti-MBP isotypes IgM and IgG were measured in sera, by ELISA, on day 42. Saline + IFA controls, unlike earlier studies in rats, had background titers of anti-MBP (100%). MBP + IFA did not produce a significant increase in anti-MBP titers above background (104%). However Pb altered MBP + IFA resulted in a significant increase in both IgM (126%) and IgG (440%). This exceeded the IgM and IgG titers (105 and 163%, respectively) produced by a 6wk p.o. exposure to 450 ppm Pb. This latter study indicates that Pb enhances the production of anti-MBP isotypes. The present study shows that Pb enhances the antigenicity of MBP. Other immunological mechanisms, e.g. Pb induction of T cell help in precipitating neural autoimmune disease, are under investigation.(Sponsored by ES-04895).

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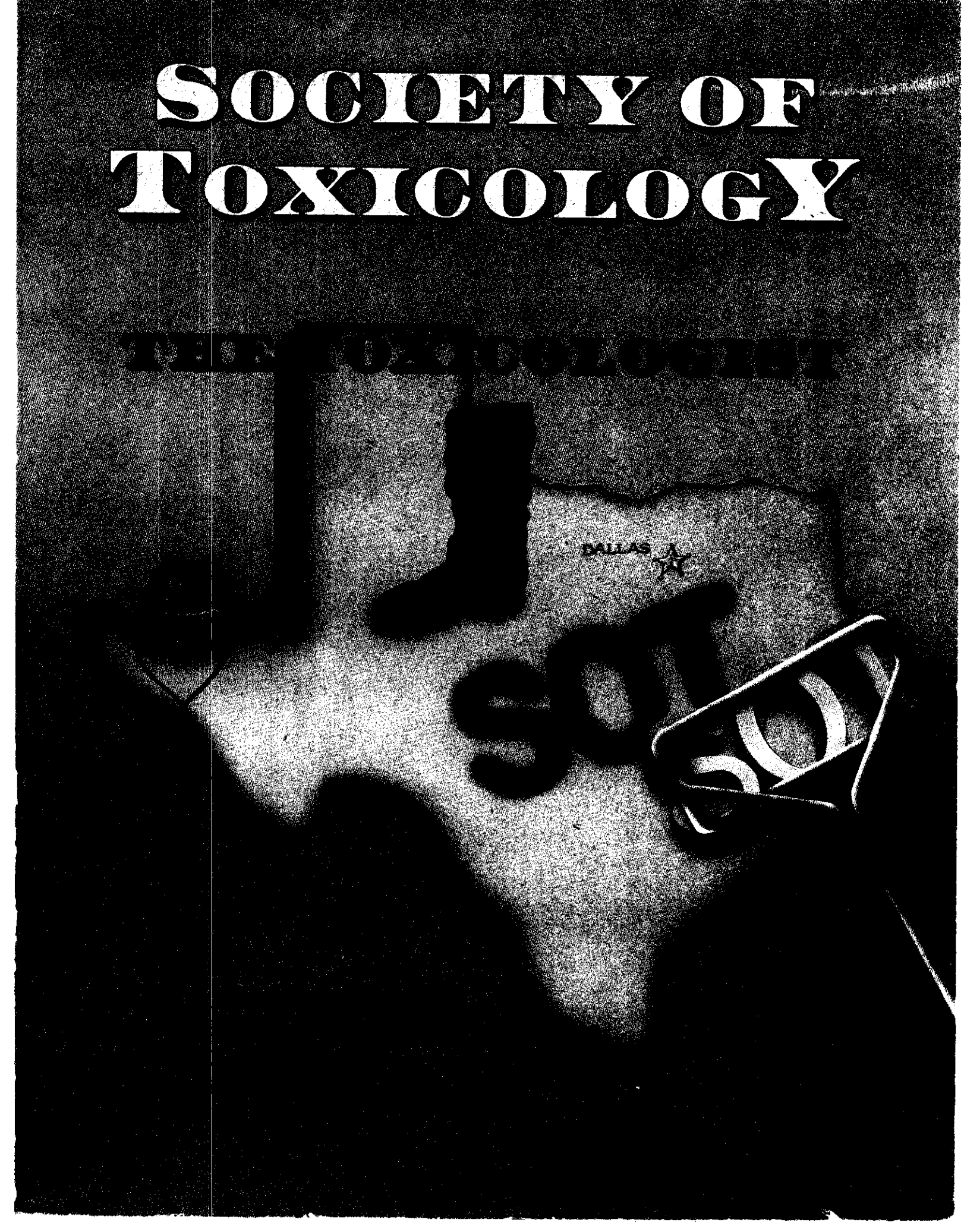

THE TOXICOLOGIST

An Official Publication of the

Society of Toxicology

Abstracts of the
33rd Annual Meeting
Vol. 14, No. 1, March 1994