

The Prevalence of Adverse Pregnancy Outcomes of Female Workers Exposed to Lead in Semiconductor Manufacturing Plants in the Cavite Export Processing Zone

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Department of Labor and Employment
Occupational Safety and Health Center
North Avenue corner Agham Road,
Diliman, Quezon City, Philippines



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Abstract

Semiconductor manufacturing is a carefully controlled, multi-stage process involving the use of chemicals that are recognized to cause adverse reproductive outcomes as spontaneous abortion, birth defects, low birth weight, prematurity, and intra-uterine growth retardation. A Major source of occupational exposure to lead for women in this industry appeared to be in the assembly and encapsulation segment where the individual integrated-circuit chip units are soldered, producing lead fumes which may inevitably be inhaled by the prevalence of reproductive outcomes among female workers exposed to lead in semiconductor companies. The respondents were 399 female workers specifically in the assembly and encapsulation sections. The data on the subjects' personal circumstances, occupational, social, past medical, obstetrical and gynecological histories were obtained through a survey interview using a structured questionnaire. Physical examination and laboratory tests for blood lead, urine amino levulenic acid (ALA), and complete blood count with blood morphology were also determined.

Majority of the respondents are solderers, 21 years old and below, single, reached of finished high school, and employed in their present position for 7-12 months. Sixty-seven percent of the subjects had blood lead levels within normal limits with a mean value of 31ug/m³ while that of the urine ALA=1.16 mg/l, and hemoglobin=127.33. Of the obstetrical and gynecological signs and symptoms, 6.75% had vaginal discharge, 3.26% experienced

dyspareunia or pain during coitus, while 1.5% had any one of the following conditions previously: abortion, ectopic pregnancy, or stillbirth. The Occupational Safety and Health Standards of the Department of Labor and Employment do not have a blood exposure index (BEI) for lead. However, the Philippines adapts the National Institute for Occupational Safety and Health (NIOSH) of the United States Department of Health and Human Services standard of 50ug/100 ml. This BEI, however, was set last 1983 and since then, there have been recommendations to make this more stringent to 10ug/100 ml since several studies have shown that at higher blood lead levels, infants and young children are highly susceptible to adverse health effects from exposure to lead (either maternally or directly).

This study is an initial investigation on women workers in the semiconductor industry. From the results gathered, specific studies may be conducted to investigate the effect of lead and other chemicals not only to the women workers but as well as to their offspring.