LETTERS TO THE EDITOR

OCCUPATIONAL EXPOSURE TO INORGANIC MERCURY VAPOUR AND REPRODUCTIVE OUTCOMES

Dear Sir:

A recently published article in the Journal is a good example of when not to conduct an epidemiological study and certainly when not to publish the results. This paper reported a study of the adverse outcome of pregnancy in relation with occupational exposure to inorganic mercury among the workers of a thermometer factory in New York State, USA. Certain statements made by the authors must be disputed and some of their methods must be challenged because they appear to be misleading and they may have distorted the facts.

The investigators analyzed occupational exposure data collected between 1948 and 1977 and the data on the outcome of 104 pregnancies among 65 women (46 exposed and 19 unexposed) abstracted from the medical records of a hospital. If the investigators had estimated the statistical power before starting the study, rather than at the end, they would have found that the results of their planned study would be meaningless due to the very small numbers of observations. The similarity of foetal death rates among the exposed workers and the general population of the state of New York (20.8% vs. 21%) should have indicated to the investigators that further analysis of the data would not be useful. Having observed small differences between the outcome of the two groups of pregnancies, and having realized that none of the observed differences were statistically significant, primarily because of the small numbers of observations, the investigators should not have published the results since they are of no use to anyone.

The study was a historical cohort study of the incidence (new events) of the adverse outcome of pregnancy. Yet, the authors have misled the readers by describing it three times in the article as a 'prevalence study.' The authors should have known that the denominator in computing the rate of congenital anomalies is live births, not pregnancies. The authors recognize that the ascertainment of pregnancies and their outcome may have been incomplete since not all foetal death cases, particularly the early spontaneous abortions, are admitted in hospitals. It was not clear whether or not the nontherapeutic induced abortions were excluded from the study. Most (92%) of the study pregnancies were conceived between 1948 and 1959, but the current (1990s) exposure levels were used as surrogates of the historical exposures. Surely, the working conditions and personal exposure levels in the 1940s and 1950s were not the same as the current levels.

As the authors recognize, there are over 40 known risk factors for foetal deaths and an almost equal number of risk factors for still births and congenital anomalies; yet, the data for most of these factors were not collected and possible confounding by all the factors was not investigated. Even though the ages of mothers at the onset of pregnancies were known and the age distributions of the two subcohorts being compared were different, the risk ratios were not adjusted for age. Occupational exposure to inorganic mercury may well be associated with increased risk of all adverse outcomes of pregnancy, but this study was incapable of rejecting the null hypothesis.

Kazim Sheikh, MBBS, DIH, MFOM

REFERENCES


AUTHORS' REPLY

Dear Sir:

We are pleased to respond to the interesting issues raised by Dr Sheikh in his letter concerning our article.

This study is not a cohort study, but rather a cross sectional study because it includes only women working at the time of data collection, collected only frequency data, and does not include person time data. All the biases inherent in this design should be well known to the reader; many were discussed in the original paper. The biases of data collection with regards to reproductive outcome (including non-detection of early foetal loss) should apply equally to the cases and controls since the data abstractors were blinded. There were no therapeutic abortions recorded for either cases or controls. The possibility of other risk factors for adverse reproductive outcome is mentioned in the paper, but should apply equally to the cases and controls. The risk ratios should have been corrected for the statistically significant age difference.

The data on reproductive outcome in female workers