

"EFFECT OF IN-HOME EDUCATIONAL INTERVENTION ON CHILDREN'S BLOOD LEAD LEVELS IN MILWAUKEE"

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Executive Summary

BACKGROUND

Education and counseling are relatively inexpensive components of some programs for reducing blood lead levels in children. However, these measures have not been conclusively demonstrated to be effective. The purpose of this study was to determine whether blood lead levels declined after in-home educational visits. The interventions were conducted from 1991 to 1993 by regular Milwaukee Health Department staff who went to homes of children with elevated (20-24 µg/dl) blood lead levels. The in-home educational visits described hazards associated with childhood lead exposure, and potential sources of the hazards in the home were identified. The importance of the child's personal hygiene, the child's nutrition, and overall dust reduction and cleaning practices was also discussed. The visits lasted about one hour and were performed by health department paraprofessionals. The in-home educational visits are part of a program designed to reduce children's lead exposure in Milwaukee where widespread blood lead testing identifies children with elevated blood lead levels. Outreach workers and/or other public health officials currently attempt to contact each family with children having elevated blood lead levels.

METHODS

Data was compiled retrospectively from the Milwaukee Health Department records of blood lead measurements compiled through the blood lead testing program. The analysis was based on a comparison of changes in blood lead levels for a study group of children who received the outreach educational interventions versus a reference group of children who did not receive the educational interventions. Children who moved or whose blood lead levels may have been affected by a lead paint abatement were eliminated from the study. The study group includes all other children who received outreach interventions between 1991 and 1993, had at least one blood lead measurement between 20-24 µg/dl before the intervention, and at least one measurement after the intervention. Similarly, the reference group includes children who from 1990 to early 1994 had at least one measurement between 20-24 µg/dl and a followup measurement. Comparisons of the children whose families

received an educational visit with a reference group were important, because changes in average blood lead level measurements may be caused by phenomena unrelated to educational intervention.

RESULTS

Average blood lead levels, adjusted for seasonality and age of the children in the Milwaukee outreach intervention program, were about 21% lower after intervention than before intervention. Blood lead levels in the reference group of non-recipients of outreach visits also declined, but by about 6%. This difference was statistically significant at a p-value less than 0.001. The difference in the average declines in blood lead levels yielded an estimate of the net effectiveness of outreach educational intervention of $21\% - 6\% = 15\%$ (with a 95% confidence interval of 8% to 23%). Effectiveness of the educational intervention did not depend significantly on a child's age or sex.

DISCUSSION

The retrospective comparison shows that in-home educational visits may have resulted in reducing children's blood lead levels by about 15% more than for a reference group without interventions. The validity of this conclusion depends upon whether children who received the visits were comparable to reference group children whose families were often unavailable for outreach visits. Families that were unavailable for outreach visits may have been more likely to exhibit behavior patterns responsible for the continued elevation of their children's blood lead levels. Nevertheless, an examination of available data on blood lead levels and demographics indicated that the study and reference groups were similar and were comparable for the purposes of determining the beneficial effects of the outreach educational program. Educational efforts at doctor's offices and clinics may also have contributed to reduced blood lead levels in both groups, thus having little effect on the net reduction.

Total costs of the outreach educational visits were estimated to be in the range of \$100 per visit. Blood lead levels of the children studied were usually still elevated after the educational intervention alone. However, important declines were observed. Educational intervention appears to be a useful and inexpensive component of lead exposure reduction programs.