

CHILD LABOUR – OCCUPATIONAL HEALTH PROBLEMS, EVALUATION AND CONTROL : A STUDY IN GEM POLISHING INDUSTRIES

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The present cross sectional study with comparison group included 586 child labourers in the gem polishing industry at Jaipur as exposed group and 569 children from two state government schools situated in the same area where the cottage gem industries are situated as comparison group. All the subjects were subjected to complete clinical examination followed by chest radiography. Blood samples from 25 exposed subjects working in polishing process and using chromium oxide as polishing material, and 25 comparison group subjects were collected to analyse blood chromium levels by Atomic Absorption Spectrophotometer. The results of exposed group were presented in the annual report of year 2002-2003. This report includes the comparison of the findings among exposed and comparison group.

In the exposed group 270 (46.1%) subjects were males while 316 (53.9%) were females while in the comparison group 274 (48.2%) subjects were males while 295 (51.8%) were females. The mean age

of the child labourers was found to be 11.31 ± 5.34 years while the same for the comparison group was 12.43 ± 6.95 years. The difference was statistically significant ($t= 3.11$, $p<0.05$).

Among the exposed group the common symptoms included respiratory symptoms in 110 (27%), eyestrain in 173 (29.5%), headache in 169 (28.8%) and repeated finger injuries during work (Fig. 1) in 220 (37.5%). Similarly among the comparison group the common symptoms were respiratory symptoms in 109 (19.2%), eyestrain in 144 (25.3%) and headache in 93 (16.5%). Thus in all, 436 (74.4%) child labourers had one or other complaint while 150 (25.6%) were asymptomatic. Similarly, in the comparison group 359 (63.1%) children had one or other complaint while 210 (36.9%) were asymptomatic. The difference was found to be statistically significant ($\chi^2=11.55$, $df=1$, $p<0.05$).

In the exposed group out of 581 subjects whose chest radiography was done, a total of 540 (93%) subjects had a normal radiograph as compared to 543 (97%) subjects in the comparison group. The difference was found to be statistically significant ($\chi^2=51.34$, $df=1$, $p<0.01$). Further analysis of chest radiography revealed that 25 (4.3%) of the subjects had tuberculosis while only 7(1.2%) subjects in the comparison group had tuberculosis and the difference was found to be statistically significant ($\chi^2=10.03$, $df=1$, $p<0.05$). Similarly, 16(2.7%) of the subjects had hilar gland enlargement and/or calcification while 10(1.8%) subjects in the comparison group had hilar gland enlargement and/or calcification. However this difference was found to be statistically non-significant ($\chi^2=1.29$, $df=1$, $p>0.05$). The hilar gland calcification in both the groups is more likely to be of infective origin and that too mycobacterial infection. The relatively high prevalence of tubercular infection among child labourers can be attributed to low socio-economic status of these workers and overcrowding in the residential as well as working areas, which favours spread of the infection.

When the blood chromium levels were estimated in a sub sample of child labourers and comparison group subjects to assess whether the polishing process using chromium oxide powder, expose the child labourers to the hazards associated with chromium (Fig. 2), it was found that the mean blood chromium levels were $2.5 \pm 1.11\mu\text{g}/\text{dl}$ among the 24 child labourers while the mean blood chromium levels were $2.33 \pm 1.1\mu\text{g}/\text{dl}$ in the 23 comparison group subjects. The difference was found to be statistically non significant ($t=0.53$, $\text{df}=45$, $p>0.05$). Thus to conclude this study reveals that the child labourers (Fig. 3) in the gem polishing industry are exposed to finger injuries and poor illumination.



Figure 1: Drilling processes may result in piercing finger injuries



Figure 2: Polishing process being carried out using chromium powder



Figure 3: Child labourers at work