

Prevalence and determination of occupational diseases of leather tannery workers

M.K. Mohanta, A.K. Saha and M. A. Hasan

Department of Zoology, University of Rajshahi, Bangladesh

The tannery industry in Bangladesh is concentrated in the Hazaribagh area. It is the largest leather-processing belt of Bangladesh. The total waste discharge area is about 25 hectares, where 20,000 people are presently living in a slum area, under extremely densely populated and unhygienic conditions. Health impact from the tannery disposal wastes is either death or increased probabilities of death and sufferings by illness including skin diseases, fevers, headaches etc. In Hazaribagh and surrounding areas, many vegetables farms are irrigated with waste water from polluted Buriganga rivers. Studies by FAO/WHO (1993) have found that metal concentrations are high and increased consumption of these vegetables, health problems for consumers in future are inevitable. Severe effects include reduced growth and development, cancer, organ damage, nervous system damage, and in extreme cases, death.

There are 206 tannery industries in Hazaribagh area. Thirty-five tannery industries were selected and visited and discussed with workers about their health problems, socio-economic conditions, knowledge about the diseases, their attitude and practice towards the prevention and control of the diseases. More than four thousands people are working in the 35 industries. Most of the workers are suffering from different diseases. About 35% of the tannery workers are suffering from gastrointestinal disease, 25% from dermatological disease, 10% from Headache, Hypertension and Lethargy (Fig. 1 and Plate 1).

In an open question to workers on predominant health problems, the respondents mentioned that skin diseases, gastric ulcers, gastroenteritis, respiratory illnesses (asthma), anemia, dysentery, headache, hypertension and lethargy were the most common health problems amongst the population in the area.

The distribution of the most commonly cited health problems are shown in Fig. 1. Gastrointestinal and skin diseases were the health problems ranked as most frequently occurring in the workers of the industry. Headache, lethargy and hypertension were mild health problems experienced by the workers of tannery industry.

The interviews were conducted to local doctors practicing in the area and provided similar results in terms of the five most prevalent health hazards in the area. The doctors identified ten health problems that were prevalent in the area. Of these five most frequently diseases were gastric ulcers, skin disease, asthma, diarrhoea and hypertensions. According to doctor's perception, skin disease, gastrointestinal problems, respiratory disorders (asthma), diarrhea and fever were the main health problems in the area throughout the year.

Environmental pollution is a major threat facing humanity in view of increasing industrialization, urbanization and population growth (Fitzgerted, 1993). Cities are becoming more and more polluted every day due to increasing discharge of untreated wastewater effluents into water reservoirs and the rivers. The polluted water poses serious health hazards to residents. As will become readily apparent to any visitor, the noxious odor of rotting flesh has created the worst case of pungent atmospheric pollution in Dhaka.

Hazaribagh area has a high incidence of a number of health problems. In this area the peoples are frequently suffering from abdominal skin ulcer, scabies, discomfort/gastritis, peptic ulcer, lung diseases, respiratory diseases, dermatitis, nasal ulcer/loss of smelling capacity, red eye/other eye illness, running nose, erosion and discolouration of teeth, asthma, puffines of face and oedema, diarrhoeal disease, high fever, conjunctivitis, urinary tract infection, jaundice, hypertension etc. A high number of mentally retarded children have been found, most of them were born in this area (IULTCS, 2004).

According to the report of the Bangladesh Society for Environment and Human Development, about half a million residents of Hazaribagh, Bangladesh, are at risks of serious illness due to chemical pollution from tanneries near their homes. The report says, large numbers of the 8000-12000 tannery workers aged 30-35 years suffer from gastrointestinal disease (58%), dermatological disease (31%), hypertension (10%), and jaundice (10%) that could be related to the pollution. Ninety

percent of these workers die before the age of 50 Vs less than 60% for the country as a whole. About a quarter of these workers are under 11 years of age (Maurice, 2001).

Chromium is one of the most harmful chemicals found in the tannery waste because of its carcinogenic potential. It may cause cancer. Chromium wounds skin, liquor chrome enters the body through hair pores and comes into direct contact with the skin (O'Flaherty *et al.*, 1956-65). Acidic effluents can cause severe respiratory problems. Gaseous emissions from the tanneries contain sulphur dioxide that is converted into sulfuric acid on contact with moisture and can damage lungs (SEHD, 1998).

The most of the workers performed their duties in acid solution at pickling stage without wearing musk, gloves, boots and apron. The sulfuric acid is strongly corrosive, which may cause permanent damage to skin if any worker worked bare hand in acid solution. Harmful chemicals like sodium sulphate and sodium bisulphate when mixed with blood for a long time it may cause cancer (Salam *et al.*, 2002).

Skin problems, allergic conditions, itching and other skin lesions are contact type disease. Usha (1989) reported that the water of khal, beel and parts of the Buriganga river are generally alkaline in nature, which is likely to be attributed to the extensive use of the alkalis soda ash, caustic soda, heavy metal salts in the tannery and dyeing industry. This alkalinity is likely to be a key factor in the skin diseases and irritations reported by local communities as they reported that the symptoms manifest themselves when their skin has come into physical contact with khal water or sediments. The majority of the respondents reported that children and tannery workers are suffered from skin diseases. Most of workers expressed that they have experienced skin problems because of their frequent contact with chemicals, and some of them were currently suffering from skin problems. They willingly showed the skin lesions on their bodies, particularly on hands, fingers and legs. The symptoms of the skin conditions include a rash, boils and irritation. While talking to the local pharmacy, they reported that the drugs for skin problems were the highest selling drugs in the tannery locality.

The tannery workers and local people believe that there are two main causes of skin problem. The

first is that physical contact especially among children who are living in unhealthy environments. The second and more frequently reported cause is contact with the chemicals used in the tannery industry.

Skin disease has increased in tannery area. Besides the workers, farmers, children and fisherman are mainly affected as they work in the polluted water. The pollutants from tannery industries are responsible for it. Pollutants from industries enter in the Buriganga river through the drain, khal and beel and end up here.

Stomach problems; the majority of the respondents also blamed the lack of proper sanitation system, tanning wastes (liquid and solids) and lack of knowledge about hygiene for diarrhoea and dysentery, which are frequently among children, slum dwellers and tannery workers. Gastrointestinal diseases have been identified as a common health problem for workers in the area, including tannery workers. The local doctors interviewed opined that this was due to irregular eating habits and the length of time between meals. Many studies confirm the occupational health problems associated with working in the tannery industry, and textile dyeing industry. Usha (1989) notes the high incidences not only skin problems but also asthma, chronic bronchitis, tuberculosis, bladder cancer and irritation of the eyes among the workers of tannery and dyeing industries.

After tanning comes the process of finishing leather, a huge amount of dyes, pigments and chemicals are used again. During making the finished products, leather particles mixed with the air and also causes respiratory problems of the workers. Most of the workers said, some of the illnesses automatically disappear when they take a leave or stop working temporarily.

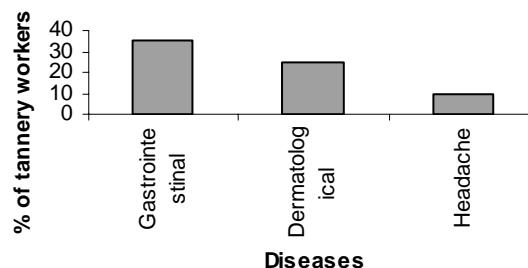


Fig. 1. Percentage of tannery workers suffering from different diseases.



Plate1. Dermatological Diseases of Tannery Workers

From the findings, the present study concludes that the Hazaribagh area has a high incidence of different number of health problems. In this area the peoples are frequently suffering from a variety of health problems that could be a direct or indirect relating to the activities of local industries. These problems include skin disease, gastrointestinal disease, respiratory illnesses, jaundice etc. The workers believe that these problems are a result of increases in the number of industrial units in the area. They expressed that tanning effluents

entering the surface water bodies in the area including drain, canal, khal, is reducing the quality of water and as a result they are unable to use it for the purpose for which it was used in the past, such as bathing and washing cattle. When they do use it, they suffer from health impacts like skin rashes and sores. Gastrointestinal problems, such as gastric ulcer or other similar gastric problems may be related to diet and the impacts of the pollution on crops, vegetables and fishes consumed by people living around the Hazaribagh

area. It is also possible that ground water is being polluted by infiltration of tannery effluent but similarly there has been no empirical research into this. The problems of diarrhoea and dysentery are unlikely to be caused directly by the tanning effluents, as they are usually the result microbial contamination. None of these findings have been confirmed with rigorous epidemiological studies. Epidemiological studies, are necessary to better determine the impact these industries having on the environment and the people who interact with it. Such evidence is crucial if policy makers and industry owners are going to be influenced to control and mitigate for environmental pollution. In order to improve the situation interventions both at the national and local levels are required. The implementation of legislation on safety precautions, banning toxic chemicals and pollutant concentrations in industrial discharges into water sources are all required. In 2003, the then government took up a Tk. 175 crore project to shift the tanneries to a 'leather estate' in Savar. The project was inaugurated in 2005. The deadline for relocating the tanneries to Savar is 2010. Sources said complexities in setting up the Common Effluent Treatment Plant (CETP) are hindering the process of shifting the tanneries. Tannery owners are also reluctant to shift their business until the government provides them with compensations and other facilities. However, education and communication campaign would be beneficial to aware the community about risks and possible

ways to minimize them, and to inform the Bangladesh public about the problems. Finally, it can be concluded that government should take necessary measures to control these problems.

References

- FAO/WHO. 1993. Evaluation of certain food additives and contaminants.' The 41st meeting of the joint FAO/WHO expert committee on food additives (JEFCA). *WHO Technical Report Series*. **837**: 53.
- Fitzgerald, W.F. 1993. Global biogeochemical cycling of mercury. *Proc. Intern. Conf. Heavy Metals Environ. Toronto, CEP, Edinburgh*, 320 pp..
- International Union of Leather Technologists and chemists Society (IULTCS), IU commission Environment (IUE). 2004. *Technical Guidelines for Environmental Protection Aspects for the World Leather Industry*. Pembroke, U.K: IULTCS. <http://www.iultes.org/environment.asp>
- Maurice, J. 2001. Tannery pollution threatens health of half-million Bangladesh residents. *Bull. World Health Organ.* **79 (1)**: 78-9.
- O'Flaherty, F., Roddy, W.T. & Lollar, R.M. 1956-1965. *The Chemistry and Technology of Leather*. Vol. I-IV. Reinhold Publishing Corp., New York.
- Salam, F.M.A., Billah, Shah, M.D. & Ridwan. 2002. *Environmental Pollution and Mitigation Measures*. (eds. Gain, P., Moral, S.),p. 68. Society for Environment and Human Development (SHED).
- SEHD. 1998. *Bangladesh Environment*. Facing 21st Century, First Edition. Society for Environment and Human development (SHED) publications, Dhaka, Bangladesh.
- Usha. 1989. *Impact of Industries in Sanganeer*. P.G. Diploma Field Study Report, Indra Gandhi Centre for HEEPS, University of Rajasthan, Jaipur, India.