

Original Article

Pattern of skin diseases among workers in ship-breaking yards in Bangladesh

Sikder MS¹, Bhuiyan MSI², Ghosh A³, Rabin F⁴**Abstract**

Dealing with different toxic chemical and physical agents in ship scrapping activities of ship breaking workers make them vulnerable to suffer from different occupational health hazards including skin diseases. This cross sectional study was carried out in Bangabandhu Sheikh Mujib Medical University, Dhaka and a temporary health center established near the ship-breaking yards of Shitakunda, Chittagong to describe the frequency and pattern of skin diseases among ship-breaking workers in Bangladesh. Five hundred workers of ship breaking yards were included consecutively, history was taken and examined to diagnose skin diseases. Physical examination and laboratory tests (patch test, prick test, woods lamp test, microscopy and histopathology) were done where needed. Most (69.2%) of the workers were from the age group 15 to 62 years and 27.8% were <18 years. Only 27 (5.4%) had some sorts of training and 24.8% do not use any type of protective measure. At least one form of skin disease was found in 47.8% workers. Types of skin diseases were contact dermatitis (19.4%), scabies (15.8%), accidental cut/burn/scald (15.6%), fungal infection (dermatophytosis / pityriasis versicolor/ candidiasis) (10.6%), impetigo / pyoderma (9.8%), seborrheic dermatitis (9.6%), acne 7.2%, palmoplantar keratoderma 4.8%, glossitis/stoma-

titis/chelitis 4.4%, lichen simplex chronicus 3.4%, urticaria 2.4% and psoriasis 1.2%. Contact dermatitis, scabies, accidental cut/burn/scald, fungal infections, impetigo/pyoderma, seborrheic dermatitis and acne are the common skin diseases among ship breaking workers. Ensuring adequate protective measures, awareness and training can control these skin diseases among ship-breaking workers.

Key words: Ship breaking worker, Occupational skin diseases, Bangladesh.

Introduction

The process of dismantling an obsolete vessel's structure for scrapping or disposal is known as ship breaking, which deals with huge amounts of hazardous materials, such as asbestos, oils, oil sludge and steel coated with paint (containing lead, cadmium, organotins, arsenic, zinc and chromium).¹ In Bangladesh all of ship breaking activities are being practiced in the coastal areas. This sector has achieved an important position in the macro and micro-economy of poverty stricken Bangladesh. The number and volume of ship scrapping in Bangladeshi yards are increasing every year. In 2015 the number of ships scrapped here was 194 whereas 60-65 ships were dismantled each year two decades ago.²⁻⁴ Bangladesh retained a leading position with India in terms of volume of recycling in 2015.² At present 80 ship-breaking yards are operating in this area and about 200,000 workers are engaged in ship breaking activities.³

Ship scrapping is the only local source of increasing raw material of re-rolling material and its demand is increasing. But considering negative impacts on environments, ship breaking activities have both challenges and opportunities for coastal zone. Exposure to large amounts of toxic chemical and physical agents can cause severe health hazards directly to the workers and indirectly to the people living nearby. Although working in ship breaking industries is a risky job, most of ship breaking industries here do not provide adequate safety measures to protect from injury and contact with toxic and harmful agents.⁵ Moreover the majority of the workers are illiterate and reluctant to use hand gloves, helmets, boots, jacket, goggles, or even wash with clean water.⁶ All these issues make laborers in the ship breaking industries vulnerable to develop different diseases

1. Professor Dr Md Shahidullah Sikder, Professor, Department of Dermatology and Venereology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh.
2. *Dr Mohammed Saiful Islam Bhuiyan, Associate Professor, Department of Dermatology and Venereology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh. Email: drsaifulib@yahoo.com
3. Dr Ajay Ghosh, Junior consultant, Central Skin and Social Hygiene Centre, Agrabad, Chittagong, Bangladesh.
4. Dr Farzana Rabin, Associate Professor, Department of Psychiatry, Holly Family Red crescent Medical college, Dhaka, Bangladesh.

*For correspondence

including skin conditions. Considering this risky nature of the job and the economic importance of this sector, we have conducted this study to see the impact of the job on skin health of the workers which will be helpful to design a guideline or policy to minimize the hazards of the sector and ensure workers health and well being. No such study has been conducted to see the pattern of skin disease of ship breaking workers is available.

Methods

It was a cross sectional observational study, conducted in the period of July 2014 to June 2015 in the department of Dermatology and Venereology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka and a temporary health care center, established at Shitakunda, Chittagong to give treatment for skin diseases of ship breaking workers. Consecutive 500 workers were enrolled in the study. After a complete physical examination, data was recorded in a pre-designed structured questionnaire, providing a detailed job condition, present and past dermatological history and the length of employment in the current job position. The duration of exposure was calculated as years in this occupation. The history of atopic symptoms, both personal and familial was also recorded. In addition, the subjects were asked about their personal work habits, use of protective gloves, boots, jacket, and goggles. The disease was diagnosed on the basis of history, clinical examination and laboratory tests (patch test, prick test, woods lamp test, microscopy and histopathology). All collected data were checked and rechecked for omissions, inconsistencies and improbabilities. Data analysis was performed by Statistical Package for Social Science (SPSS), version-17.

Results

Median age of the workers was 23 years with a range from 15 to 62 years; most (69.2%) were from the age group of 18-45 years, 27.8% were <18 years and 3.0% were >45 years. (Table-I)

Table - I: Age distribution of ship-breaking workers.

Variables	Frequency	Percentage
Age (years)		
<18	139	27.8
18-45	346	69.2
>45	15	3.0
Total	500	100.0
Median age (range)	23 years (15-62 years)	

33.2% workers work in 8 hours shift, 54.6% 8-12 hours shift and 12.2% work more than 12 hours daily. Working experience in ship breaking yard for <1 years was in 76 (15.2%), 1-5 years 275 (55.0%) and >5 years in 149 (29.8%). Only 27 (5.4%) have at least some sorts of training and rest 473 (94.6%) are non-skilled. Regarding availability or use of protective measures at work place- 52.6% workers use hand gloves, 36.8% wear boots, 21.4% use goggles, 16.6% use helmet or cap, 13.2% wear apron or jacket and 24.8% do not use any. Types of works are heavy work (53.6%), dealing with chemicals/oil/gas (26.6%), fire work (10.8%) and work in water, mud or sand (69.0%). (Table-II).

Table -II: Working characteristics of ship-breaking workers.

Characteristics	Frequency	Percentage
Working hours per shift (hours/shift)		
8	166	33.2
8-12	273	54.6
>12	61	12.2
Duration of work in the ship-breaking industry (years)		
<1	76	15.2
1-5	275	55.0
>5	149	29.8
Trained/non-trained (Any kind of training)		
Yes	27	5.4
No	473	94.6
Availability or use of protective measures for ship-breaking industry workers*		
Gloves	263	52.6
Boots	184	36.8
Apron/jacket	66	13.2
Goggles	107	21.4
Helmet/Cap	83	16.6
Not available or ignore to take any measure	124	24.8
Types of work*		
Heavy work	268	53.6
Dealing with chemicals/oil/gas	133	26.6
Fire works	54	10.8
Work in water/mud/sand	365	69.0

*Multiple response

At least one form of skin disease was present in 47.8% of ship-breaking workers. (Table-III)

Table - III: Frequency of skin disease among ship-breaking workers (n=500).

Skin disease	Frequency	Percentage
Present	239	47.8
Absent	261	52.2
Total	500	100.0.0

Frequency of different skin diseases are contact dermatitis 19.4%, scabies 15.8%, accidental cut/burn/scald 15.6%, fungal infection (dermatophytosis/pityriasis versicolor/candidiasis) 10.6%, impetigo/pyoderma 9.8%, seborrheic dermatitis 9.6%, acne 7.2%, palmoplantar keratoderma 4.8%, glossitis/stomatitis/chelitis 4.4%, lichen simplex chronicus 3.4%, urticaria 2.4% and psoriasis 1.2%. (Table-IV)

Table- IV: Distribution of skin diseases among ship-breaking workers (n=500).

Skin diseases	Frequency	Percentage
Contact dermatitis	97	19.4
Acne	36	7.2
Seborrheic dermatitis	48	9.6
Accidental cut/burn/scald	78	15.6
Scabies	59	15.8
Fungal infection (Dermatophytosis/pityriasis versicolor/candidiasis)	53	10.6
Palmoplantar keratoderma	24	4.8
Lichen simplex chronicus	17	3.4
Impetigo/Pyoderma	49	9.8
Glossitis/stomatitis	22	4.4
Urticaria	12	2.4
Psoriasis	6	1.2

*Multiple responses

Discussion

Ship-breaking yards in Europe and elsewhere in the developed world have largely closed due to the high cost of health and safety measures and insurance for workers. Most (nearly 90 percent) of the industry have been already shifted to developing countries (China, India, Bangladesh, Pakistan, Vietnam, Philippines and Turkey) where health and safety standards are minimal and workers are desperate

for work.⁷⁻⁸ Among these countries ship breaking industries in Turkey and China are more environmentally friendly and disposal of wastes is strictly monitored.⁸ Currently Bangladesh is one of the leaders of world ship breaking industries and giving important contribution in countries economy, where labor and environmental laws are hardly followed. Ship breaking zones in Chittagong, Bangladesh and Alang-Sosiyia, India are called "toxic hot spots" or "sacrifice zones" which can also be considered as ship breaking capitals of the world, since the majority of the world's ships are broken on their beaches.⁹

Ship breaking works have to deal with different harmful physical and chemical agents. It is an accident prone industry and also there are risks of many acute and chronic diseases due to contact with different chemicals. Its health issues have not yet been properly addressed, only few studies found that workers in this sector are prone to have skin diseases, respiratory diseases, tuberculosis, malaria, malnutrition, diarrhea, gastrointestinal problems, muscle and chest pain, ophthalmological complains, headache, cold and cough, minor to severe accidental injury, burn, blast injury, cancer and even death.¹⁰⁻¹² But no single study has been found that dedicatedly searched the cutaneous diseases or skin conditions related to ship breaking works. In the current study, median age of the workers was 23 years with a range from 15 to 62 years. Most (69.2%) of the workers were from the age group 18-45 years and 27.8% were under age of 18 years. In a previous study about 66% ship breaking workers in Bangladesh were belonged to the age group 20-39 years of age.¹⁰ Another survey found that about twenty percent of laborers are under age fifteen.⁸

The majority of workers works for 8-12 hours in a shift and a good numbers them work even more than 12 hours daily. In 55.0% laborers working experience in ship breaking yard is 1-5 years, 29.8% more than 5 years and 15.2% leave their work within one year of job. In a previous study it was found that 32% workers had left their job within the first two years and 57% workers continued 2 to 10 years¹⁰. This rapid change of job may be due to its risky nature, low wages and lack of job satisfaction.

Almost all (94.6%) ship breaking workers in the study were unskilled and (24.8%) do not use any form of protective measures (Boot, Gloves, Apron/jacket, Goggles) may be due to unavailability or ignorance. Used protective means were hand gloves (52.6%), boots (36.8%), goggles (21.4%), helmet or cap (16.6%), apron or jacket (13.2%). In an earlier study in the same industrial area 42.13% workers used gloves, 20.37% used boots, 8.33% used caps and 29.17% used goggles.¹⁰ In the current study 47.8%, of

workers are suffering with different types of skin diseases. In two previous studies in ship breaking yards in Bangladesh skin diseases was found in 56% and 15.94% of workers.^{6,13} According to a statement given for national trade union federation Pakistan (NTUF) in 2012, in a ship breaking yard in Gadani all 500 (100%) workers were suffering with skin disease after an oil tanker was leaked.¹⁴ All these studies just mentioned the presence of skin involvement with other human health impacts of ship breaking works. These did not give detail pattern and of types of skin diseases of peoples workings in ship breaking yards. In the current study common skin diseases are contact dermatitis, scabies, accidental cut / burn / scald, fungal infection (dermatophytosis / Pityriasis versicolor / candidiasis), impetigo / pyoderma, seborrheic dermatitis and acne. Higher rate of contact dermatitis may be due to dealing with different chemicals and physical agents. Poor personal hygiene at work place, overcrowded residence and hot humid working place can be considered as the predisposing factor of scabies and fungal infection. Working with lube oil, cutting oil and hot-humid chamber inside ship may be act as aggravating factors for seborrheic dermatitis and acne. Other skin diseases include palmoplantar keratoderma, glossitis / stomatitis / chelitis, lichen simplex chronicus, urticaria and psoriasis.

References

1. Ventikos NP, Chatzinikolau S. Hazardous waste management and ship recycling: Friends or foe? <http://www.srcosmos.gr/srcosmos/showpub.aspx?aa=13016>
2. 2015 List of all ships scrapped worldwide -Facts and Figures. Available from: http://www.shipbreakingplatform.org/shipbrea_wp2011/wp-content/uploads/2016/02/Stats-Graphs_2015-List_FINAL.pdf
3. Dunn J. Where boats go to die: Fascinating pictures inside a Bangladeshi ship-breaking yard where once mighty liners are reduced to scrap. Mailonline [internet]. 2015 Oct. Available from: <http://www.dailymail.co.uk/news/article-32578/Where-boats-die-Fascinating-pictures-Bangladeshi-ship-breaking-yard>.
4. SHED (Society for Environment and Human Development). Bangladesh Environment: Facing the 21st Century. 2nd ed. editor. Philip Gain. Dhaka: University press limited; 2002:340.
5. YPSA. Workers in Ship Breaking Industries: A base line survey of Chittagong, Bangladesh. Young Power in Social Action (YPSA), Chittagong, 2005: 79.
6. Muhibbullah M. Health hazards and risks vulnerability of ship breaking workers: A case study on Sitakunda ship breaking industrial area of Bangladesh. Global Advanced Research. Journal of Geography and Regional Planning 2013; 2(8): 172-184.
7. Prakash A. Terrible conditions facing workers in Asian ship-breaking yards <https://www.wsws.org/en/articles/2006/03/alan-m27.html>
8. <https://news.vice.com/article/visiting-the-deadlyship-breaking-yards-of-bangladesh>.
9. Steve L. Sacrifice Zones: The Front Lines of Toxic Chemical Exposure in the United States. Cambridge, MA: MIT Press; 2010.
10. Hossain MS, ChowdhurySR, Jabbar SMA, Saifullah SM and Rahman MA. Occupational Health Hazards of Ship Scrapping Workers at Chittagong Coastal Zone, Bangladesh. Chiang Mai J. Sci. 2008; 35(2) : 370-381
11. Demaria F. Shipbreaking at Alang-Sosiya (India): An Ecological Distribution Conflict. Ecological Economics 2010;70:250-260.
12. Greenpeace International and International Federation for Human Rights. End of Life Ships: The Human Cost of Breaking Ships. Amsterdam, The Netherlands: Greenpeace International. 2005:11.
13. Roy B. Health problems among the workers in the ship-breaking industry. Department of Occupational and Environmental Health, National Institute of Preventive and Social Medicine(NIPSOM), Dhaka, 2003.
14. NTUF Statement on ship breaking situation. National Trade Union Federation Pakistan (NTUF). Available from : <http://www.ntufpak.org/media.html>.