

LIVING AND HEALTH CONDITIONS OF MIGRATORY SUGARCANE HARVEST WORKERS OF AHMEDNAGAR DISTRICT IN MAHARASHTRA

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Abstract

Background-Maharashtra being one of the developed states in India , is a hub for in-migration. Seasonal migration of agricultural workers during sugar cane harvesting season has been an established phenomena. Thousands of workers with their families come to Maharashtra for the period of approximately six months, starting from November each year. This migratory population faces various adversities of life. Agricultural workers face a large number of health problems, many of which arise out of their work

Objective- To understand the living and the health conditions of migratory sugarcane harvest workers of Ahmednagar district in Maharashtra.

Material and Methods- Prospective observational study was carried out for the period of six months in the operational Zones of 3 Co-operative Sugar Processing Units.

Results- Study revealed that the literacy rate among workers was extremely low. Majority belonged to lower socioeconomic class and from underprivileged section of the society. The housing and living conditions at work site were extremely poor. The nutritional status of the workers and their family members was unsatisfactory. Malnutrition, respiratory, musculoskeletal, dermatological, gastrointestinal diseases were very much prevalent. Overall reproductive health of males and female members was worrisome. Lack of antenatal care and unsafe delivery practices result in high maternal and perinatal morbidity and mortality. The immunization status of the children of these workers was unsatisfactory.

Conclusion- A well defined policy, comprehensive approach, well coordinated actions and political will for social welfare and medical care, will help to improve the plight of migratory sugarcane harvest workers.

Keywords: Migratory agricultural workers; Sugar cane harvest workers; Occupational hazards; Occupational health care

1. Introduction

National Safety Council of the US estimated that the agriculture was the most dangerous occupation followed by mining, quarrying and construction.¹ Migration of agricultural labour from drought-prone areas to prosperous agricultural belts is a common phenomenon in India. Migration involves a break with the past, with family, with cultural milieu and with whatever little social security they enjoy in their native villages. Stable populations have well-tied roots for maintaining health, but migration means leaving such support systems behind and enter into a new environment, where no basic health support systems are accessible for them. For many, it means coping with diseases they already had while

dealing with the stress of resettlement. Still others will develop health problems due to strenuous and hazardous working conditions at work place and primitive, unhygienic and over-crowded living conditions in the place of migration. This has implications both for the health of migrants themselves; and for that of the community they move into.¹ Unless well thought-of or well planned by local PHC system in anticipation of incoming migrant labour, the medical services are usually not in a position to cope up with the influx of people, who are non residents.¹

An estimated, two and a half million laborers are employed in harvesting and transportation operations in every season (Oct-Mar) in the sugarcane growing areas of Maharashtra,

India, in order to feed raw material for about 145 sugar processing units in the state. While a few factories in the state which are located on the boundaries, recruit labour from neighboring states, all other factories' employ labour from dry belts within the state. These labour are economically, culturally and socially marginalized and belong to underprivileged and deprived classes of the community. The low social and economic strata, to which these labour belong to, itself is a determinant of poor health. They often have inadequate access to health care even in their native villages. Migrants health often remains into "gaps" between programmes, especially where prevention is concerned..The labour contractors of these workers, often is a person that belongs to the same labour force, who establishes some leadership qualities, are from unorganized sector Usually, a dispensary run by the factory authorities near the factory site, with bare minimal facilities, meant for providing out-patient services to the regular employees, is the only source of health facility for these migratory seasonal labour also, who work and stay in scattered locations.

In order to develop a planned programme of medical relief to link them up with local PHC system, with a component of occupational health approach, a study was undertaken to understand the living and health conditions of migratory sugarcane workers in selected temporary camp sites in a sugar factory zone near village Loni of Maharashtra, India.

2. Material & Methods

The study was carried-out in the operational Zones of Co-operative Sugar Processing Units, namely Dr. Padmashree Vithalrao Vikhe Patil Cooperative Sugar Factory, Pravaranagar, Ta. Rahata, Ganeshnagar Sahakari Sakhar Karkhans, Ganeshnagar, Tal. Rahata, Dr. Baburao Tanpure Cooperative Sugar Factory, Ta. Rahuri. The selected factory employs about nearly 10000 migratory seasonal worker families, every season, to harvest sugarcane crop grown in a radius of 30-40 kilometers, and also to harvest crop grown in free zone, which is normally located beyond 45 kms..

The present study was carried-out by the Centre for Social Medicine of Pravara Institute of Medical Sciences – Deemed University. The Centre for Social Medicine a constituent unit of the University operates Mobile Medical Units and Rural Health Centres in the vicinity

of Sugar Processing Units of Ahmednagar district, as part of a network of "out-reach" programmes, to reach the needy at their door steps. Mode of carrying harvested sugarcane to the collection site for transportation; and also the handling of sugarcane by different laborers in the process put the workers under different categories which could have implications for health. Head lifters (40%), hand lifters (30%) and shoulder lifters (30%) are the three main catagories of workers.

The nature of load carriage and the posture adopted could result into musculo-skeletal problems of cervical spine, lumbar spine or those of joints of extremities, depending upon weight bearing by the affected joints. Planned visits of the mobile clinics, with prior information to the workers families through the Contractors and Medical Officer of the Sugar Factory are being normally conducted to the work sites and temporary residential camps, as per the convenient timings of the seasonal labour. The present pilot study, however, included data that has been collected through a structured Performa by the medical officers while treating the patients who attended the mobile clinics organized from **October 2010 to February 2011**. As many as 1234 patients were treated during the clinics organized in this period. Morbidity data has been classified as per ICD-IX, WHO while heights and weights were compared with Indian Council of Medical Research standards for assessment of nutritional status in children who, serve as sensitive indicator in this respect..Grading of nutritional status of children below 15 years was done as per Waterlow's Classification, for international comparison. Dietary information was collected by recall method and the same was analyzed to arrive at the average food intake per capita per day and their calorific values have been calculated on the basis of standard nutritional values of different food items consumed. This can be translated for different age groups by way of consumption units, if required.

3. Observations and Discussion

3.1 Socio- demographic features: The average family size of the migratory harvest workers was estimated as **6.5**, which reveals the fact that the efforts of national family welfare programme have not achieved desired results in this community, who rely mainly on manual physical work to earn their livelihood.

Of the 1234 patients who attended clinics, 710 (58%) are male and 524 (42%) are female. Of which, 336 (27 %) were children below 15 years as shown in Table 1. The low turnout rate of women, is attributed to the facts including their shyness, casual attitude towards their health and busy schedule of household chores. However, of the total 524 women visited the clinic, 330 (63 %) were in the reproductive age group (15 - 44 years). This has also thrown some light on the acute unmet needs of this group by the regular public health system, in terms of ante natal and post natal care. In the absence of regular coverage through visits to such needy women and their new born children, health problems are likely to be missed. In many European countries, the pregnancy related morbidity in migratory women has been found to be higher than the local women.¹ High rates of pre-

mature and low birth weight babies, and complications of delivery and miscarriages are common amongst this population. During study period - unregistered pregnant women , who attended the maternity ward of the author's University teaching hospital for delivery services revealed quite interesting facts of poor coverage of antenatal care including no tetanus toxide injection, non consumption of iron folic acid tablets etc. They report to the hospital at a very advanced stage of labour and are not ready to stay in the hospital after delivery for recovery, as their absence at home and at work front is unaffordable. The acceptance of female sterilization is low, in spite of large family size. Problem of unwanted pregnancy, poor knowledge of contraception and family planning services continue to be a major challenge in migratory population.

Table 1: Gender distribution of migratory harvest workers attending the clinics

Age in Years	Male Number	Per cent	Female Number	Per cent	Total Number	Per cent
Less than 5	80	11.27	62	11.83	142	11.51
05 to 14	136	19.16	58	11.07	194	15.72
15 to 24	170	23.94	64	12.21	234	18.96
25 to 34	122	17.18	144	27.48	266	21.56
35 to 44	80	11.27	122	23.28	202	16.37
45 to 54	54	07.60	32	06.10	86	06.97
55 and above	68	09.58	22	04.20	90	7.29
Total	710	100.00	524	100.00	1234	100.00

The economically active age group is expected to be employed in the migratory work force, so the maximum number, who attended the mobile clinics was in the age range of 15 - 55 years. The sickness load in this group is bound to affect the productivity. From this angle also their health matters. The study has revealed that about 91 per cent of the adult labour was never enrolled in school for studies, while a meager 5 per cent had completed four years of primary schooling and 4 per cent had 5 to 7 years of schooling. It is a stunning fact that no female labours have entered the formal school system. The children also do not go to schools, as they accompany the parents into the migratory place to help adults in the field and at home, to the best of their ability. So the illiteracy status is not restricted to a single generation.

3.2 Housing and living conditions: All migratory harvest workers are required to stay

in open fields at the outskirts of the village, where harvesting operations are on. They arrange a hut-like make-shift tent five-feet-by-four in size and about three-and-a-half feet height, with two or three cane mats or a plastic sheet and three bamboo's provided by the factory management. A series of such make shift shelters are erected in a limited area in open fields near the village, where sugarcane is to be harvested, leading to overcrowding, to accommodate a big group of workers. Since these tiny triangular huts are not sufficient to accommodate all the family members, except young children, all other members sleep in the open, during cold winters without much protection from vagaries of nature. Being close to sugarcane fields, the entire area is infested by mosquitoes, flies and other insects. The thought of other amenities like adequate safe drinking water, garbage and sewage disposal, toilet, bath and other sanitary

facilities are simply imaginary in their lives. They manage to collect drinking water from bore wells, open wells, irrigation canals, percolation tanks, open water ponds depending on availability around their work sites and so-called camp sites. This water being not potable, cause water bone diseases like diarrhoea, dysentery etc.

3.3 Nutritional status: Table 2 shows the Nutritional Status of Children as per Waterlow Classification. It has revealed that majority of

the children were malnourished. Only 11.3 per cent of the children were normal. This observation merits special attention and highlights need for supplementary feeding programme as a welfare activity besides Nutrition Education Programme for the parents. This could be done in the form of subsidized ration food or provision of readily available nutritive foods like green leafy vegetables, raw sprouted pulses, vitamins and mineral tablets (iron folic acid).

Table 2: Nutritional Status of Children as per Waterlow Classification

Age Group (in years)	Normal nutrition	Mild Undernurish	Moderate undernurish	Severe undernurish	Total
Below 5	12	56	48	26	142
5 – 9	10	38	32	24	104
9 – 14	16	28	26	20	90
Total	38	122	106	70	336
Percent	11.3	36.3	31.6	20.8	100.0

The staple diet of this labour is normally a roasted preparation from Jowar, Bajira or Wheat, which is called as Bhakar or Chapati. They consume the same at breakfast, lunch and dinner, with dry or raw chilly paste (Chatni) and onion. They consume hardly any vegetables and other preparations, in their food. The study revealed that each adult male consume 4-5 bhakar each weighing 250gms, in a day, adult female consume 3-4 bhakar a day, while children depending upon their age consumes 1-3 bhakar a day. The additional food intake daily they have is 3 cups of tea. Analysis of daily food intake of these labours reveals that each adult male is getting approximately 3000 calories per day, while female is getting 2400 calories per day as against the requirement of 3900 calories and 3000 calories respectively, for the type of work they are performing. While, their food intake has almost no nutritive values in terms of vitamins, proteins, fats and minerals the calorific requirement was also not met, which was deficient by over 25 % in both male and female.

3.4 Immunization Status: Of the 142 children below 5 years old treated, only 30 ie., 21 % were immunized for all six (Diphtheria, Pertusis, Tetanus, Polio, Measles, and T.B) vaccine preventable diseases viz DPT, BCG, OPV and Measles vaccine. The dropout rate in the children below 2 years was observed as 60 %, the reasons being the fixed

immunization programme being followed by the local PHCs, doesn't suit these harvest workers who are always on the move, and the care taker of the babies can not afford to spare time for this, by missing the wages. The planned dates of immunization are not convenient. Camp approach through mobile clinics synchronizing to their internal migration may improve the immunization coverage among this migratory community.

3.5 Habits: The hard and long stretches of physical work, without any other source of entertainment, majority of the workers - both male and female, get addicted to one or the other habits like smoking, tobacco chewing and alcohol. These habits have negative implications on their health in the long run .It was observed that, nearly every alternative adult smoke *bidi* (local version of cigarette) , and over 68 % chew tobacco along with lime in it, while nearly 39 % resort to consuming cheap country liquor (Table3). The high prevalence of alcohol consumption results in physical and mental abuse of women and children, including domestic violence. It is noteworthy that nearly 59 % were addicted to more than one habit, while 32 % had all the three habits. A strong health education and Counseling programme should go a long way in overcoming the problem of addictions and thereby help in prevention of long term health and social ill-effects.

Table 3: Distribution of adult subjects by their Habits

Sr. No	Type of Habit	Male	Female	Total	Per cent
1.	Smoking	336	112	448	49.9
2.	Tobacco Chewing	358	254	612	68.2
3.	Liquor	292	56	348	38.8
4.	Any two habits	306	222	528	58.8
5.	All three habits	242	38	280	31.2

3.6 Morbidity Profile: Table 4 reveals that, over one-fourth of the patients were suffering from Infectious and Parasitic diseases like malaria, gastro-enteritis, amoebiasis, tuberculosis and Sexually Transmitted Diseases (STDs), measles, chicken pox and helminthiases and scabies. High frequencies of parasitic infections have also been reported by Camargo et al in 1994 among agricultural migrant workers.² This is as a result of poor personal hygiene, overcrowding, lack of access to potable drinking water, poor and

unsanitary surroundings including lack of latrines, bath facilities, lack of proper family life education etc. The temporary shelters provided by the contractors need to be supported by basic facilities like safe drinking water, electricity, disposal of sewage. Charity gesture by sugar factory management and legal mandatory provision, making it obligatory on the part of labour contractors to provide basic amenities, should help improve the situation, in the long run.

Table: 4 Morbidity Pattern among migratory workers as per ICD (broad groups)

Sr. No	Name of Disease Group	Number of Patients	Per cent
1	Infectious & Parasitic diseases	310	25.1
2	Diseases of respiratory system	186	15.0
3	Diseases of musculo-skeletal & connective tissues	154	12.6
4	Diseases of skin and sub-cutaneous tissues	112	9.0
5	Diseases of nervous system & sense organs	112	9.0
6	Diseases of blood and blood forming organs	98	8.0
7	Injuries and accidents	99	8.0
8	Diseases of digestive system	74	6.0
9	Symptoms/signs & ill-defined conditions	90	7.3
		1234	100.0

Second major group of patients, which consists of 15 % of the total, were suffering from diseases of Respiratory System like acute respiratory infections both upper and lower respiratory tract, and chronic bronchitis. Higher rates of respiratory problems have been reported by Ciesielski et al in 1994 in migrant workers.³ similar problems were reported in sugarcane workers in South Africa. (78% and 88% had upper and lower respiratory tract problems).^{4,5} The possible reasons are smoking habits, smoke nuisance of fuel, dust, pollens etc, on account of both occupational exposure or poor general environmental conditions. There are reported cases of lung cancers in sugar cane farmers due to chronic exposure to soil and crops containing silicate.^{6,7} There is interplay of infections and environmental factors, as highlighted.

As many as 154 patients (12.6%) have complained about back ache and joint pains, which was grouped under "diseases of musculoskeletal and connective tissue". This is obviously due to carrying of heavy weight on head and shoulder, poor nutrition, and posture adopted during sugarcane cutting, tying and loading operations. While cutting the cane at the root, the laborers have to bend and cut by applying significant force. Further, the bundles of harvested sugarcane are carried by both male and female on their heads or shoulders to load-in the bullock carts or trucks parked on the main roads, which are away from the harvesting spot. Study in Spain, showed that control population, migratory workers in farms had twice the incidence of musculoskeletal disorders, dehydration and heart complaints.(Parron, Castello ,

Bernhardt)^{8,9,10} A number of studies in Sweden have reported high rates of occupational injuries among migrant workers requiring longer rehabilitation after injury. (Egger et al 1990, Molinaro 1994, Carballo and Siem 1996,)^{11,12,13} Hundred and twelve patients (9 %) were suffering from common skin diseases like fungal infections, scabies, eczema, which are attributed to their lack of cleanliness, lack of adequate personal clothing due to which they frequently exchange the dresses among themselves or continue using the same for several days etc. An equal number i.e 9 % of patients have shown signs and symptoms of "Diseases of Nervous system and Sense organs" like migraine, epilepsy, cataract, visual disturbances, low vision, refraction errors, and inflammation of eye lids, disorders of external ear, otitis media and deafness. In sugar cane cutting workers, eye injuries are common due to sharp edge of sugar cane leaves.

Diseases which were observed in 74 patients (6%) of the cases were grouped under digestive system. Among the diseases of digestive system, gastritis, gastric ulcer, peptic ulcer, duodenal ulcers were on the top, while dental caries, periodontal diseases, pre-cancer conditions like sub-mucous fibrosis, rated second. This may be attributed to the dietary habits, including consumption of raw and dry chilly pastes as the supportive dish in their staple diet (Jowar or Bajira), and irregular and untimely food taking habits and also to their tobacco chewing, smoking and alcohol consumption habits.

Ninety eighty cases (8%) had shown signs of iron deficiency anemia and vitamin deficiencies. Occupational accidents are approximately two times higher among immigrant workers in Europe.(Bollini and Siem-1995)¹⁴.Eight percent of workers attending hospital had injuries like knife cuts, fall from bullock-carts, foot injuries due to dry and sharp stump of harvested crop, as the labour walk bare footed. A sizeable number of children ie., 24 or nearly 25 % of the injuries/accident cases reported to the clinics, are with burns. This may be because while adults are engaged in harvesting work, a number of grown up children are required to look after younger ones and also household chores like cooking, exposing them into burn injuries. Although, not reported in this study, huts constructed with dry sugarcane leaves,

catch accidental fires at times, due to open cooking practices adopted by the labour. Fortunately in this study, snake bites, scorpion stings are not reported but these are known. Accidental hand injuries and other accidental injuries are fairly common, for which the labour mostly adopt their traditional treatment methods like applying mud paste, urination, applying tree-bark, roots, leaves etc. As an alternative, the first line of contact person for such treatment is the local traditional healer. The atmosphere of modern hospitals with its concrete walls is particularly uncongenial to them, as they are reluctant to utilize the hospital, even if the treatment is made available to them free of charge.

Conclusion

The migratory, poor, illiterate population engaged in the seasonal and strenuous nature of work, deserve special attention for their social welfare and health care. A comprehensive, well coordinated, community based, long term, continuous care approach is necessary. A well defined policy and its proper implementation is needed. All such activities need to incorporate, elements of Primary Health Care, occupational health care, social welfare programme like provision of crèche / day care centers, education drives, health education, counseling, Nutrition supplementation etc.

This was a pilot study. However, well planned in-depth epidemiological studies would help to identify the social and health problems of this migratory work force. This should help built intervention strategies in occupational health in future. These observations and reports highlight the need for safety precautions like use of personal protective devices like hand gloves, eye glasses, gum boots or suitable foot wears. Due attention needs to be given to ergonomically suitable posture, design of the sickle used for cutting operations, so also the weight to be carried on the shoulders at a time, both for men and women and ban on child labour.

First aid for injuries, snake bites etc need to be made available on the spot through trained staff. Planned anti-tetanus immunization coverage needs to be provided. Considering the pre-dawn early hours of working adequate lighting facilities need to be made available.

Above all a strong health education supported by comprehensive occupational health

coverage with legislative back-up is needed to improve the plight of these migratory sugar cane harvest workers.

References

1. Carballo M, Mboup M, WHO regional publication, eastern Mediterranean series-25,cairo; 2003
2. Camargo, L M ,Ferreira,M U,Krieger, H et al Unstable hypoendemic malaria in Rondonia (western Amazon region Brazil); Epidemic outbreaks and work associated incidence in an agroindustrial rural settlements .*Am J Trop med*,1994..(51);1:16-25
3. Ciesielski S, Loomis, D P, Mims, S R. Pesticide exposure cholinesterase depression and symptoms among North Carolina migrant workers. *American journal of public health* 84(3):446-451
4. Miller W F, Reed D M ,Banta J, Sugar cane workers; Morbidity and mortality . *Hawaii Med J* 1993;52:300-6
5. Newman RH, Asbestos like fibers of biogenic silica in sugar cane.*Lancet*;ii:857
6. Boeniger MF, Fernback J,Hartle R et al , Occupational exposure to silicate fibers and PAH during sugar cane harvesting. *Ann Occup Hyg* 1988;32:153-9
7. Amre D K, Infante rivard, Dufresne A, Ernst P. Case control study of lung cancer among sugar cane farmers in India .*Occup Environ Med*,1999;56:548-552
8. Parron,T .Estudio de los reisgos occasionados por el uso de plaguicidas en la zona del poniente almeriense.Ponencia presentada al curso sobre immigration v Enfermedades,1992,Nerja Malga
9. Castello, S. f. Condiciones de trabajo y seguridad e hygiene en los invemaderos .Ponencia presentada al “curve sobre immigration y Enfermedades transmisibles”1992,Nerja, Malga
10. Bernhardt, J, Langley, R L,Agricultural hazards in North Carolina..*NC med J* 1993;54:512-515
11. Egger,M.Minder,C, E,Smith G D ,Health inequalities and migrant workers in Switzerland.*The Lancet* 1990;336:816-818
12. Molinaro,R,Les estragers abusent ils de l'assurance-accident Suisse?CNA-inf.medicdes,Heft1994; 9:628-634
13. Carballo, M, Siem ,H Migration,migration policy and AIDS.In Haour-Knipe,M,rector.(Eds) *Crossing borders: migration,ethnicity and AIDS*(PP.31-49).London: Taylor and Francis
14. Bollini P, Siem H .No real progress towards equity: Health of migrants and ethnic minorities on the eve of the year 2000.*Social science and medicine* 1995;41(6):819-828