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OCCUPATION RELATED INJURIES AMONG AGRICULTURAL WORKERS: AN EXPLORATORY STUDY

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Abstract:

Background: Agriculture is one of the most hazardous sections in both the developing and industrialized countries. Injuries are becoming major public health problem among agriculture workers in worldwide. Since India is an agriculture dependent country and also passing through a major socio-demographic and technological transition, injuries are becoming a major health problem for workers working in this sector. **Objectives:** To find out the prevalence, pattern and predictors of "Injuries" suffered by agricultural workers in context to their occupation. **Material and Methods:** A cross sectional study conducted in a rural area of North 24 Parganas district of West Bengal. The study area was selected by multistage simple random sampling technique. A recall period of two months for minor injuries and one year for major injuries was used. A total of 4 villages covering 1510 both male and female agriculture workers and among them 302 workers was selected for the study purpose. **Results:** Total number of farmers who had suffered from any kind of injury was 174(57.5%) out of whom 134(77%) were mild, 32(18.4) were moderate and 8(2.6%) suffered from severe injuries. These injuries were significantly associated with their age OR(CI) [5.67(2.64-12.16)], caste OR(CI) [2.71(1.47-5.00)], education OR(CI) [3.64(1.70-7.78)].Type of work OR(CI) severity OR(CI) [2.32(1.27-4.35)] and duration OR(CI) [2.67(1.50-4.76)] of work proved to be significant correlates of Injury. **Conclusions:** Considering the high morbidities due to injuries focusing on health education, personal protective equipment efforts based on local behavioral practices is needed.

Key Words: Occupation related injury, duration of works.

Introduction:

Indian agriculture accounts for 25% of total gross domestic product (GDP) on which 75% of country's population depend [1.] Indian farmers are burdened with injury due to lack of proper occupational procedure, poor ergonomics and underutilization of health care services. Poverty, illiteracy and environmental stress play their own detrimental effect in making their lives more miserable [2,3]. In fact in the Indian context agriculture is one of the most hazardous occupation [4.] Yet there is no robust, appropriate and organized health education programmes for prevention and control of occupation related risk factors and morbidities among the agrarian population.

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AIMS AND OBJECTIVE

- To determine the pattern of injuries suffered by the farmers working in the study population a rural area of North 24 Parganas district of West Bengal.
- To elicit the relationship of the injuries with the occupational differentials and other contextual factors if any.

MATERIALS AND METHODS

STUDY DESIGN: - It is a community based descriptive epidemiological study with a cross-sectional design.

STUDY AREA:-

The study was conducted in agriculture workers of Bergum-II Gram Panchayat(GP) of Habra Block-I in North 24 Parganas District of the state of West Bengal, where total male and female agriculture workers aged between 18-60 years was 1510 according to census 2011[5].This area was chosen due to the people with agriculture occupation is most prevalence.

STUDY PERIOD – The study period of the present study was from October 2015 to September 2016. Among the total study periods, data collection was done from May 2015 to April 2016. Total study period was two years.

STUDY POPULATION:

Persons aged 18-60 years agriculture workers residing at the study area.

INCLUSION CRITERIA:

-All the agriculture workers aged 18-60 years.

-The workers who were staying in the area for more than one year.

EXCLUSION CRITERIA:

- Pregnant and lactating women.

-Critically sick patients and

-Individuals who did not give consent.

RESULT AND DISCUSSION

Agriculture is the main occupation in India, and it is related by many agro-based industries.

India is a developing nation and presents the demographic features similar to the other developing nations of the world.

In this study male workers were 175(57.9%) and female were 127(42.1%). Male Female ratio was 1.38:1. Among the total workers 265(87.7%) were Hindu and 37(12.3%) were Muslim in religion. According to caste wise distribution of the total workers, 167(55.3%) were ST, 115(38.1%) were SC and 20(6.6%) were others. Most of them were illiterate i.e 207(68.5%) followed by primary i.e 65(21.5%), secondary i.e 28(9.3%) and higher secondary 2(07%). Among the total workers, 173(57.2%) belong to class V socio economic status followed by 111(36.8%) class IV and 18(6%) belong to class III socio economic status according to B G Prasad‘s socio economic status scale 2014**.**

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In a study of Kulkarni Rajesh R et al[5]Among the study participants 55.75% were men and 44.25% were women, with male to female ratio of 1.25:1. Most of the agricultural workers (89.5%) were Hindus and 47% were illiterates; 295 (73.75%) belonged to Class V socio-economic status.

In this study during the working period they were reported to suffer from many tools and machine related hazards. Total injuries in this study were 174(57.6%). Among them 89(29.5%) were in lower extremity, 45(14.9%) were in upper extremity and 23(7.7%) had multiple location, 14(4.6%) head and 3(0.9%) neck injury**.**

In a study of Mohan D et al[6] indicated that the injuries led to a large number of limb amputations 43 cases (80%)] among the persons operating the machine or playing with the machine. Another study of Inoka E et al [7]showed lower limbs were the commonest affected site by injury (41.8 %, n=23). Lindsay, S S et al [8] in their study shows that tagging injuries most commonly affected lower limbs and trunk, while clipping injuries affected the upper limbs.

Another study of Copuroglu C et al[9] explained that major agricultural injuries were related to the extremities. Hand was the most commonly injured part (*n*: 9) followed by the distal part of the lower limb (*n*: 7) and foot (*n*: 7). McCurdy et[10] showed multiple injury in same individual occurred more frequently than chance. Multiple injuries to individual suggested personal and or environmental risk factors.

In this study in bivariate analysis injury burden were significantly more in the males then the females [OR:1.86, 95%CI: (1.17-2.96)] farmers those who were more than 30 years old [OR:2.10, 95%CI: (1.22-3.62)], belong to ST [OR:1.82, 95%CI: (1.14-2.89)] illiterate workers [OR:1.94, 95%CI: (1.16-3.24)], those who were live in in low- income (PCI<842 or class-V) [OR:1.87, 95%CI: (1.17-2.98)], joint family[OR:2.43, 95%CI: (1.36-4.31)], those who were addicted[OR:1.54, 95%CI: (1.07-2.44)] individual with working more than eight hours [OR:2.09, 95%CI: (1.31-3.34)] and those who were heavy workers [OR:2.35, 95%CI: (1.46-3.80)].

After adjusting to other variables, injury burden in workers aged more than 30 years old [AOR:5.67, 95%CI: (2.64-12.16)] with schedule tribes [AOR:2.71, 95%CI: (1.47-5.00)] illiterate [AOR:3.64, 95%CI: (1.70-7.78)] workers and those who works more than eight hours [AOR:2.67, 95%CI: (1.50-4.76)] and heavy workers[AOR:2.32, 95%CI: (1.27-4.35)] were sown to be statistically significant**.**

Xiang H et al[11]in their study in bivariate analysis shows that injury burden were non-significant both age and sex but it is significantly augmented according to increasing age of the working population both univariate and bivariate analysis.

CONCLUSION

Despite these limitations, this study identified some important factors that need attention for prevention of injuries which typically happen among agriculture workers.

This research revealed not only the high prevalence of injuries but also the occurrence of a large population with modifiable risk factors like alcohol consumption, smoking, high load and long

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duration of work and non-use of personal protection equipment (PPE); the latter if taken care will definitely reduce the hazards of the agriculture workers.

Therefore, targeted interventions that promote healthy lifestyles and reduce the risk factors, along with early diagnosis and treatment will help in ameliorating the suffering of these personnel of the agriculture sector who are actually feeding the whole nation.

The health sector alone cannot give relief to the workers of this important occupation. It needs an intersectoral approach with active participation of the departments/ministries of agriculture, education, mass media, science and technology, disaster management, communication and transport; finance….actually the list is long. The society itself must come forward to highlight the suffering of the cultivators with community participation with successful implementation of active and sincere intervention programmes by health policy makers and administrators.

Proper development of educational programs to teach farmers on safety precautions during working periods in agriculture fields, reinforcement of safety behaviors, especially the proper use of PPE in the workplace, when working with machine, would be effective approaches for preventing and lowering the burden of mechanical hazards related to agriculture occupation.

About 71% of the Indian population lives in the rural area out of which more than 58% are working in the fields day and night, in sun and rain to provide food to the whole nation. The irony is that we give the least importance to the travails of this sacred occupation. It is high time that the utmost priority is given to mitigate the suffering of this large population and to provide them with health and happiness. This is the key to turn India into one of the foremost nations of the world. This is in line with what our former Prime Minister Lal Bahadur Shastri said*"Jai Jawan,Jai Kisan"* thus equating the most important sector of this country like defence with agriculture. So let us all rise and come forward to bring smile to each and every individual who works in the field, making this occupation honourable, healthy and happy.

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Table1: Socio-Demographic and Behavioral Characteristics of the study population (n=302)

Socio-Demographic and behavioral characteristics		Number	Percentage
Age (Years)	18-30	78	25.8
	31-40	95	31.5
	41-50	71	23.5
	51-60	58	19.2
Gender	Male	175	57.9
	Female	127	42.1
Religion	Hindu	265	87.7
	Muslim	37	12.3
Caste	ST	167	55.3
	SC	115	38.1
	Others	20	6.6
Educational status	Illiterate	207	68.5
	primary	65	21.5
	secondary	28	9.3

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	higher secondary	2	0.7
Socio-economic status (Modified B. G. Prasad's)[a]	Class III	18	6
	Class IV	111	36.8
	Class V	173	57.2
Marital status	Single	8	2.6
	Married	294	97.4
Type of family	Nuclear	74	24.5
	Joint	228	75.5
Smoking history	Yes	106	35.1
	No	196	64.9
Consumption of alcohol	Yes	129	42.7
	No	173	57.3

Table 2 : Distribution of study participant according to duration and types of work (n=302)

Duration of work	Number	Percentage
Less than 8 hour	128	42.4
8 hour or more	174	57.6
Total	**302**	**100**
Sedentary workers	61	20.2
Moderate workers	111	36.8
Heavy workers	130	43
Total	**302**	**100**

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Table 3 : Distribution of study participant according to injury (n=302)

Injury[a]	Number	Percentage
No injury	**128**	**42.4**
Injury	**174**	**57.6**
Head injury	14	4.6
Neck injury	3	0.9
Upper extremity injury	45	14.9
Lower extremity injury	89	29.5
Multiple location injury	23	7.7
Mild	134	44.4
Moderate	32	10.5
Severe	8	2.6

Table 4: Predictors of injuries (n=174) suffered by the study population; Bivariate and multivariate logistic regression.

INDEPENDENT VARIABLE	INJURED n(%)	BIVARIATE MODEL OR (95%CI)	MULTIVARIATE MODEL AOR (95%CI)
Age			
≤30yrs	30(17.2)	**1**	**1**
>30yrs	144(82.8)	2.10(1.22-3.62)*	5.67(2.64-12.16)*
Sex			
Female	62(35.6)	**1**	**1**
Male	112(64.4)	1.86(1.17-2.96)*	1.62(0.80-3.27)

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Caste			
SC and Others	68(39)	**1**	**1**
ST	106(61)	1.82(1.14-2.89)*	2.71(1.47-5.00)*
Education			
Literate	65(37.3)	**1**	**1**
Illiterate	109(62.7)	1.94(1.16-3.24)*	3.64(1.70-7.78)*
Type of family			
Nuclear	54(31.1)	**1**	**1**
Joint	120(68.9)	2.43(1.36-4.31)*	1.87(0.94-3.74)
PCI			
Class III and IV	63(36.2)	**1**	**1**
Class V	111(63.8)	1.87(1.17-2.98)*	1.56(.90-2.69)
Addiction			
No	71(40.8)	**1**	**1**
Yes	103(59.2)	1.54(1.07-2.44)*	0.86(0.46-1.16)
Severity of work			
Others	84(48.2)	**1**	**1**
Heavy	90(51.7)	2.35(1.46-3.80)*	2.32(1.27-4.35)*
Duration of work			
≤8 hrs	61(35)	**1**	**1**
>8 hrs	113(65)	2.09(1.31-3.34)*	2.67(1.50-4.76)*