Community Based Intervention for Preventing Corneal Injury from Paddy Grain

Asim Kumar Sil

Abstract

Purpose: To assess community based intervention in preventing general injury from paddy grain. Method: Six villages were selected. Educative materials were produced to propagate use of protective glass during the time of threshing. Interactive meetings were organised. Plastic dark goggles and white goggles were promoted. Hospital records were studied and compared with previous year. Result: Not a single case of paddy grain injury was reported from these area. Conclusion: Campaign and availability of protective goggles is helpful in preventing such injury.

The prevalence of ocular injury in agriculture-workers is unknown in India; but data from few studies suggest that this is quite common1,2. It varies from region to region according to the nature of the crop. Injury from sugarcane leaf is quite common in northern and western India, grape vine injury is common in central and south India. Paddy grain injury of cornea is very common in coastal India where rice is grown as main crop. In recent years the incidence of paddy grain injury has gone up because mechanical threshers have replaced the practice of manual separation of grains by beating the plant against a hard platform. This article depicts the results of a community based intervention for preventing corneal injury in a rural area of West Bengal, India.

Paddy grain and the eye: The age old practice of separation of paddy grains from the plant used to be hitting the tip of the plant against a bamboo platform. This process takes longer time and involves more manpower. Since the speed of the grain during separation is less there is less chance of eye injury by paddy. Now the process has been replaced by the use of mechanical threshers to do the same work in much shorter time and save manpower.

Rice is the main crop in major part of India. In some fertile areas of the country it is grown thrice a year. Naturally farmers engaged in paddy cultivation in those areas are more exposed to the risk of corneal injury at the time of harvesting. Plants grown in different seasons are not of same length. In Southern part of Bengal one high yielding variety of rice is harvested during April-May. This plant is shortest in length and has much more number of grains than the other ones. That is why cases of corneal abrasion are much more reported during April-May.

During harvesting the entire family of a farmer is involved in the work. Mechanical threshers are used usually by two gentlemen who operate the machine by feet and place the tip of the plant over the spin. Another person, usually a lady constantly sweeps the ground to collect the grains at one place. Her face is usually closer to the machine and more prone to injury. Anybody, even a child moving close to the thresher may get injured.

Farmers have a habit of covering the head and face with a piece of cloth to avoid dust but leave the eyes open while threshing. This practice keeps the eyes unprotected. The commonest mode of injury is abrasion of cornea by rapidly moving seed. The most unfortunate sequel of this injury is development of fungal keratitis. Paddy grain has fine hair like structures over the outer coating. That is why the grains get anchored to conjunctiva firmly. Sometimes the grain lodges inside the upper fornix and remain unnoticed. Even the plant may start growing inside the eye5. Treatment of fungal keratitis is difficult in any peripheral location. The cases report late and are often complicated by the use of unknown eye drops and native medication. Fungal culture facility is usually not available in the periphery and antifungal medications are used empirically. Application of too many drops often reduces the efficacy of antibiotics.
All these issues contribute to unilateral corneal blindness after paddy grain injury and most of them belong to active working age. Many factors like huge cost of medication, loss of wages and ultimately loss of vision make paddy grain injury a public health issue.

**Method:**

The most obvious way of preventing this corneal injury is protecting the eyes at the time of threshing. Wearing plastic goggles was considered to be the cheapest and easiest option. Education materials were produced to propagate the use of protective glass. Posters were displayed in places that farmers visit usually. Eye health talks were organized in different occasions and festivals. One public education video was developed in local language to motivate people to wear glasses. This video was shown in different places and in local cable network. CD of this 6 min. film was distributed among volunteers who used it locally.

The most effective way of communication was interactive meeting with the farmers. Farmers’ Co-operatives were selected for holding the meetings (fig 1). Every large village in this part of Bengal has one co-operative where farmers get agricultural assistance and evening is the suitable time to get them there. Interactive meetings were organized. It started with the thought provoking video and followed by discussions. It came out through discussion that many farmers do the job of threshing in the evening using electric lights. Sometimes it is overtime work and sometimes it is done to avoid daytime heat. Initially we tried to promote plastic dark goggles usually used after cataract surgery (Fig 2). But we had only thought of day time use. We made change in the goggles; dark glass was replaced by a white one (Fig 3) without increasing the cost. This white goggle got more acceptances. The price could be kept under INR 30. The message was conveyed that any kind of spectacle available at home is good enough to protect eyes.

**Result:**

Six villages in Mahishadal Block of East Medinipur district in west Bengal were selected for intensive campaigning few weeks before the harvesting time. These villages were selected because of the proximity to the hospital and for the villagers this is the closest eye care facility. The population of these villages was approximately 15,000. We looked at the hospital records after the harvesting season and compared it with the previous years. Till 2010 about 3 to 4 cases of paddy injury used to be reported from this population. After this intervention not a single case has been reported from this area.
Discussion:

There are always barriers in the usage of safety eyewear amongst workers. In one study from central India about three-fourth of the workers reported using it all or most of the time during work. Despite knowing that protective eyewear devices offer safety from work-related injuries workers do not tend to use them for multiple reasons. These include some blurring of vision, discomfort, fogging, unusual appearance, people making fun of them, slipping of the goggles due to sweat and slowing work pace.

Prevention of ocular injuries in agriculture workers will indirectly reduce the incidence of microbial keratitis amongst them. Srinivasan et al had demonstrated that treating corneal abrasions with antibiotic ointment by health workers at the village level significantly reduced the incidence of bacterial and fungal corneal ulcers, but primary prevention of injury is always the best. It is all about developing the attitude of adopting safety measures. Constant effort of educating the community would result in consciousness about eye safety and develop peer pressure to wear protective goggles. Providing protective goggles at an affordable cost should complement this effort. The manufactures of the threshers have great responsibility in ensuring safety by modifying the design.

The current experience with a small defined population encourages us to scale up the campaign involving all stake holders and making the goggles available locally.

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References: