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A PILOT STUDY ON THE ROLE OF COTTON DUST EXPOSURE IN THE DEVELOPMENT OF VICHARCHIKA (ECZEMA) AMONG COTTON FARMERS IN SOYGAON TEHSIL OF SAMBHAJINAGAR DISTRICT, MAHARASHTRA.

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ABSTRACT

Cotton farming is one of the major agricultural occupations in Maharashtra and involves continuous exposure to cotton dust, pesticides, fertilizers and various environmental allergens. Prolonged contact with cotton dust may lead to occupational skin disorders, particularly eczema-like conditions. In Ayurveda, the clinical features of eczema can be correlated with Vicharchika, which is characterized by symptoms such as Kandu (itching), Pidaka (eruptions), Shyavata (discoloration), Rukshata (dryness) and Srava (discharge). Despite extensive involvement of farmers in cotton cultivation, limited data are available regarding the impact of cotton dust exposure on skin health in rural Maharashtra. The present

pilot observational cross-sectional study was conducted to study the association between cotton dust exposure and the prevalence of Vicharchika (Eczema) among cotton farmers in Soygaon tehsil of Sambhajinagar district, Maharashtra. Participants actively engaged in cotton farming were selected through purposive sampling. Detailed occupational history, duration of exposure to cotton dust, clinical symptoms and dermatological findings suggestive of Vicharchika were recorded using a structured questionnaire and clinical assessment preform. Data were analysed using percentage and frequency distribution methods. A considerable number of cotton farmers exposed to cotton dust presented with symptoms such as itching, dryness, erythematous lesions and skin irritation suggestive of Vicharchika. Increased prevalence was observed among farmers with prolonged occupational exposure and inadequate use of protective measures. Continuous exposure to cotton dust appears to be an important occupational risk factor for the development of Vicharchika (Eczema) among cotton farmers. Early identification, preventive awareness and protective strategies may help reduce the burden of occupational skin disorders in the farming community.

KEYWORDS: Vicharchika, Eczema, Cotton Dust, Occupational Hazard, Cotton Farmers, Ayurveda.

INTRODUCTION

Agriculture plays a vital role in the Indian economy, and a significant proportion of the rural population depends on farming as their primary source of livelihood. Maharashtra is one of the leading agricultural states of India, and cotton cultivation forms an important part of its agrarian economy. Cotton farming is extensively practiced in various regions of Maharashtra, including Sambhajinagar district, where a large number of farmers are continuously engaged in activities such as sowing, spraying pesticides, harvesting, storage and transportation of cotton. During these agricultural activities, farmers are exposed to several occupational hazards including cotton dust, pesticides, fertilizers, environmental pollutants, microorganisms, ultraviolet radiation and excessive sweating. Continuous exposure to these irritants may adversely affect the health of farmers and predispose them to various occupational diseases, particularly skin disorders. Among the various occupational hazards associated with cotton farming, cotton dust is considered one of the important irritants responsible for allergic and inflammatory reactions of the skin. Cotton dust consists of fine particles of cotton fibre, plant debris, soil particles, microorganisms and chemical residues

that remain suspended in the environment during handling and processing of cotton. Repeated exposure to these particles can impair the natural protective barrier of the skin and lead to itching, dryness, erythema, scaling, fissuring and inflammatory lesions resembling eczema. Farmers generally work for prolonged hours under hot and humid environmental conditions without adequate protective measures such as gloves, masks or protective clothing, which further increases the risk of developing occupational skin diseases. Lack of awareness regarding occupational safety and limited access to healthcare facilities also contribute to delayed diagnosis and chronicity of skin conditions among farmers. Occupational skin disorders are among the most common work-related health problems worldwide and account for a considerable burden of morbidity in agricultural workers. Prolonged exposure to agricultural dust and chemicals may lead to irritant contact dermatitis, allergic dermatitis and chronic eczema. Eczema is a chronic inflammatory skin disorder characterized by severe itching, erythema, dryness, papules, scaling and occasional oozing lesions. Persistent itching often results in excoriation, secondary infection and lichenification, thereby affecting daily activities and quality of life. The prevalence of occupational eczema is increasing due to repeated exposure to allergens and irritants in the workplace, especially among workers involved in farming and manual labor.In Ayurveda, the clinical presentation of eczema can be correlated with Vicharchika, which is described under Kshudra Kushtha in classical Ayurvedic texts. Vicharchika is characterized by symptoms such as Kandu (itching), Pidaka (eruptions), Shyava Varna (blackish discoloration), Rukshata (dryness), Bahu Srava (discharge) and Daha (burning sensation). According to Ayurveda, Vicharchika is predominantly a Kapha-pradhana Tridoshaja Vyadhi involving vitiation of Dosha, Dhatu and Twak. Improper dietary habits, environmental exposure, unhygienic conditions and repeated contact with irritant substances are considered important causative factors responsible for the manifestation of skin diseases. Continuous exposure to cotton dust and environmental allergens during farming activities may aggravate Dosha imbalance and contribute to the development of Vicharchika among cotton farmers. Modern agricultural practices have increased the intensity and duration of occupational exposure among farmers. During cotton harvesting and processing, large quantities of cotton dust become airborne and come in direct contact with exposed areas of the skin. Prolonged contact with these irritants may initiate inflammatory reactions and hypersensitivity responses, eventually resulting in chronic skin lesions. In rural populations, farmers often ignore early symptoms such as mild itching or dryness due to workload and lack of medical awareness, allowing the disease to progress gradually into chronic eczema-like conditions. Such dermatological problems not only affect

physical health but also reduce work efficiency, productivity and overall quality of life. Despite the high prevalence of cotton cultivation in Maharashtra, very limited epidemiological studies are available regarding the association between cotton dust exposure and the occurrence of eczema or Vicharchika among cotton farmers. Most occupational health studies have focused mainly on respiratory disorders, while skin manifestations related to cotton dust exposure remain comparatively neglected. Soygaon tehsil of Sambhajinagar district is one of the important cotton-growing regions where farmers are continuously exposed to cotton dust during various agricultural operations. However, scientific data regarding the prevalence of occupational skin disorders in this region are scarce. Therefore, the present pilot observational study was undertaken to assess the prevalence of Vicharchika (Eczema) among cotton farmers in Soygaon tehsil and to evaluate the role of cotton dust exposure as an occupational risk factor in the development of skin disorders.

MATERIALS AND METHODS

The present study was designed as a pilot observational cross-sectional study to assess the prevalence of Vicharchika (Eczema) among cotton farmers and to evaluate the role of cotton dust exposure as an occupational hazard in Soygaon tehsil of Sambhajinagar district, Maharashtra. The study was conducted among cotton farmers who were actively involved in various farming activities such as sowing, harvesting, storage and handling of cotton. Participants were selected from different villages of Soygaon tehsil by purposive sampling method. Farmers who had regular occupational exposure to cotton dust and were willing to participate in the study were included. Both male and female farmers between the age group of 18 to 65 years were considered for the study. Farmers suffering from severe systemic illnesses, pre-existing chronic dermatological disorders unrelated to occupational exposure and individuals unwilling to participate were excluded from the study. A total of 50 cotton farmers were included in this pilot study. Detailed demographic data including age, gender, duration of farming occupation and working hours were recorded. A structured questionnaire was used to collect information regarding occupational exposure, duration of contact with cotton dust, use of personal protective measures, and history of pesticide exposure and presence of dermatological complaints. Clinical history related to itching, dryness, erythema, scaling, eruptions, and discharge and burning sensation was carefully documented. Thorough clinical examination of the skin was carried out in all participants. The diagnosis was made based on clinical features suggestive of eczema and correlated with the Ayurvedic features of Vicharchika described in classical texts. Symptoms such as Kandu (itching), Pidaka

(eruptions), Rukshata (dryness), Shyava varna (discoloration), Srava (oozing) and Daha (burning sensation) were assessed during examination. The severity and distribution of lesions were also noted.Occupational exposure to cotton dust was assessed on the basis of duration of farming work, daily exposure hours and direct involvement in cotton handling activities. Information regarding the use of gloves, masks or other protective measures during farming activities was also recorded to evaluate awareness regarding occupational safety practices. The collected data were compiled and analysed using simple statistical methods such as percentage and frequency distribution. The prevalence of symptoms suggestive of Vicharchika among cotton farmers exposed to cotton dust was calculated and interpreted. The observations obtained from the study were presented in the form of tables and charts wherever necessary. A predesigned and structured questionnaire was used for data collection. The questionnaire included demographic details, occupational exposure to cotton dust, duration of farming work, use of protective measures and symptoms suggestive of Vicharchika such as itching, dryness, and erythema and skin lesions.

ETHICAL CLEARANCE

Ethical clearance for the present pilot observational study was obtained from the Institutional Ethics Committee prior to commencement of the study. The study was conducted in accordance with ethical principles for biomedical research involving human participants. All participants were informed about the nature, purpose and objectives of the study in their local language before enrolment. Written informed consent was obtained from each participant prior to data collection and clinical examination. Confidentiality and privacy of the participants were strictly maintained throughout the study. Participants were assured that the collected information would be used only for academic and research purposes. Participation in the study was entirely voluntary, and participants had the right to withdraw from the study at any stage without any hesitation or consequence.

STATISTICAL ANALYSIS

The data collected from the study participants were compiled, coded and entered into a Microsoft Excel spreadsheet for analysis. Descriptive statistical methods were used to summarize the findings. The results were expressed in terms of frequency and percentage for categorical variables such as gender, presence of symptoms suggestive of Vicharchika, and use of protective measures. Continuous variables such as age and duration of occupational exposure were represented as mean ± standard deviation wherever applicable. The prevalence

of Vicharchika-like symptoms among cotton farmers exposed to cotton dust was calculated using percentage distribution. Comparative analysis was performed based on duration of exposure, age groups and occupational practices to identify possible associations between cotton dust exposure and skin manifestations. The findings were presented in tabular and graphical form for better interpretation. No advanced inferential statistical tests were applied, as this was a pilot observational study.

RESULTS

A total of 50 cotton farmers participated in the present pilot observational study conducted in Soygaon tehsil of Sambhajinagar district, Maharashtra. The study population consisted of both male and female farmers actively engaged in cotton farming and regularly exposed to cotton dust during various agricultural activities such as sowing, harvesting and processing. Out of the total participants, a significant proportion of farmers reported symptoms suggestive of occupational skin involvement. It was observed that itching was the most common symptom, followed by dryness, erythema, and scaling and occasional skin eruptions. Clinical examination revealed that a considerable number of participants had skin manifestations consistent with eczema-like lesions, which were correlated with features of Vicharchika. When the prevalence was analysed, a notable percentage of farmers exposed to cotton dust showed signs and symptoms suggestive of Vicharchika. Higher prevalence was observed among farmers with longer duration of occupational exposure and those who did not use any protective measures during farming activities. Farmers with more than 10 years of exposure demonstrated comparatively higher incidence of skin complaints as compared to those with lesser duration of exposure. It was also observed that farmers who worked for longer hours daily in cotton fields had increased frequency of symptoms such as itching and dryness. Individuals who were not using protective gloves or clothing showed greater severity of skin manifestations. Seasonal variation was also reported by some participants, with aggravation of symptoms during peak farming periods. Overall, the study findings indicate that continuous exposure to cotton dust is associated with a higher occurrence of Vicharchika-like symptoms among cotton farmers. The results suggest a possible occupational relationship between cotton dust exposure and development of skin disorders in the study population.

DISCUSSION

The present pilot observational study was conducted to assess the prevalence of Vicharchika (eczema) and to evaluate the role of cotton dust exposure as an occupational hazard among cotton farmers in Soygaon tehsil of Sambhajinagar district, Maharashtra. The findings of the study suggest a notable association between prolonged occupational exposure to cotton dust and the occurrence of eczema-like skin manifestations. Cotton farming involves continuous exposure to various irritants such as cotton dust, plant fibres, soil particles, pesticides and chemical fertilizers. Among these, cotton dust plays a significant role in causing skin irritation due to its fine particulate nature and ability to adhere to the skin surface for prolonged periods. Repeated exposure may disrupt the skin's natural protective barrier, leading to dryness, itching, inflammation and erythematous lesions. In the present study, itching and dryness were observed as the most common symptoms among exposed farmers, indicating early features of occupational dermatitis. The increased prevalence of skin symptoms among farmers with longer duration of exposure suggests a dose–response relationship between cotton dust exposure and development of dermatological problems. Farmers working for more than 10 years showed comparatively higher frequency of symptoms, which indicates that chronic exposure may contribute to cumulative skin damage. Similar patterns have been observed in occupational dermatology studies where prolonged exposure to agricultural dust and chemicals has been linked to chronic eczema and contact dermatitis. From an Ayurvedic perspective, the clinical features observed in the study can be correlated with Vicharchika described under Kshudra Kushtha. The symptoms such as Kandu (itching), Rukshata (dryness), Pidaka (eruptions) and Shyava Varna (discoloration) were commonly observed among participants. Continuous exposure to dust and irritants may aggravate Kapha and Pitta dosha, leading to Twak dushti and manifestation of Vicharchika. Thus, occupational exposure to cotton dust can be considered as an important external triggering factor contributing to doshic imbalance in susceptible individuals.The findings also highlight the role of protective measures in reducing occupational skin problems. Farmers who did not use gloves, protective clothing or any form of barrier protection reported higher severity of symptoms. This indicates that lack of awareness and poor implementation of occupational safety practices significantly increases the risk of skin disorders. In rural agricultural settings, limited access to protective equipment and low awareness regarding occupational hazards further contribute to disease burden. When compared with existing literature, occupational skin diseases such as irritant contact dermatitis and eczema are commonly reported among agricultural workers exposed to organic dust and chemical agents.

The results of the present study are consistent with the general understanding that continuous exposure to irritants plays a key role in the development of chronic skin conditions. However, specific studies focusing on cotton dust exposure and its dermatological effects in Indian rural populations are limited, making the present pilot study a useful contribution to this area of research. The present study has certain limitations. The sample size was small as it was a pilot study, and the findings may not be generalizable to a larger population. The diagnosis was based mainly on clinical assessment and symptom reporting, without laboratory confirmation or advanced dermatological investigations. Despite these limitations, the study provides preliminary evidence suggesting a possible occupational association between cotton dust exposure and Vicharchika-like skin manifestations.

Further large-scale studies with bigger sample sizes, objective diagnostic tools and long-term follow-up are recommended to establish a stronger causal relationship and to explore preventive and therapeutic strategies for occupational skin disorders among cotton farmers.

CONCLUSION

The present pilot observational study indicates that cotton farmers in Soygaon tehsil of Sambhajinagar district are frequently exposed to cotton dust as part of their routine occupational activities, which may act as an important risk factor for the development of skin disorders. A considerable proportion of farmers in the study reported symptoms such as itching, dryness, erythema and skin eruptions, which are clinically suggestive of eczema and can be correlated with Vicharchika. The study findings suggest a possible association between prolonged exposure to cotton dust and increased occurrence of Vicharchika-like symptoms, particularly among farmers with longer duration of occupational exposure and inadequate use of protective measures.

Thus, it can be concluded that cotton dust exposure may contribute significantly to occupational skin morbidity among cotton farmers. Early identification of symptoms, improvement in occupational safety practices and awareness regarding protective measures are essential to reduce the burden of such skin disorders in the farming community. Further large-scale studies are recommended to confirm these findings and to develop preventive strategies.

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