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Occupational Hazards in Ophthalmology inBundelkhand region

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Abstract:*Occupational hazards or working conditions that can lead to an illness or death constitute important health challenge across the globe.Anoccupational hazard is a hazard experienced in the workplace. Occupational hazards can encompass many types of hazards, including chemical hazards, biological hazards (biohazards), psychosocial hazards, and physical hazards. CommunityOphthalmology was described as a new discipline in medicine promoting eye health and blindness prevention through programsutilizing methodologies of public health, community medicine and ophthalmology. The aimof study- To evaluate the variousoccupational ocular hazards in health settings and their causes, affected age group, sign/symptoms and prevention. A total of 200Patients who were recognized as a case of occupational ocular hazards, were included in this cross-sectional study. The age group of thepatients to be studied was between 20 to 60 years. An assessment of present complaints, detailed clinical history (present and past) andoccupation related history as like type of work, working environment, place, working hours.Ophthalmological check-up as externalexamination of the eyes, visual acuity, torch light examination, slit lamp examination, Fluorescein eye staining, Schirmer's test,refraction, direct ophthalmoscopy, was done. In case injury, B-scan, CT-scan, was also done. In our study the male female ratio was2.3:1 and most common affected age group was 31-40 years (38%). Labour and farmer (27.5%) were more prone to occupationocular hazards. Almost 75.03% patients had primary ocular complaints of watering and redness of eye and most common sign wasconjunctival congestion and sub-conjunctival haemorrhage (67.57%).*

Keywords:*Community Ophthalmology, Fluorescein eye staining, Occupational hazard, Schirmer's test, Slit lamp examination, Subconjunctivalhaemorrhage, Visual acuity.*

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I. Introduction

Occupational hazards not only constitute an important etiological entity for vision loss, but also account for a substantial part of occupational injuries.Occupational hazards hurt workers and their families, while imposing a huge burden with respect to manpower and social costs[1]. These injuries can lead to severe consequences and enormous financial losses There is no sector whose employees are immune to the risk of eye injuries[2]. When compared to the developed countries, the incidence and severity of Occupational hazards is higher in developing countries. This may be attributed to lower level of priority assigned for occupational health and workplace safety.Occupationalhazards are reported to be encountered mostly in younger workers.Occupational hazards or working conditions that can lead to an illness or death constitute important health challenge across the globe[3,4]. This is so as work related health hazards are potential sources of fear, psychological and emotional disturbance[5,6]. It can be a source of discomfort, pain and disability[7]·Moreover, vocational induced hazards may be life threatening and at times a cause of death[8]. Therefore, so as long man engages in vocations, interest remains in occupational health hazards. Different health hazards exist as there is different vocations. Hence the type and nature of health hazards are peculiar to particular occupation and the practitioners are essentially prone to such hazards. For instance, among ophthalmologists, there were reports of work-related back pain[9,10], infectious conjunctivitis[11], contact dermatitis[12,13], chronic headache, and visual disturbances. Generally, health care workers are exposed to an array of physical, chemical, biological, and psychosocial hazards[14]. Viral hepatitis is a dreaded occupational health hazard among health personnel[15], ophthalmologists inclusive. Man has to work to earn a living however, he should be protected from work related hazards to give optimal service and, prevent grief/disability and avoidable deaths. Avoidable risks should be known and be guarded against. Like practitioners in other vocations especially medical field, ophthalmic practice exposes its practitioners to health hazards ranging from inconsequential non-life threatening to life threatening ones. While there were

documentations on job-specific hazards for many vocations in resource-endowed society[16,17], it is a sharp contrast for most occupations in resource-limited society. Interestingly, ophthalmologists concern themselves studying eye related hazards in many vocationspayinglittle attention to studying health hazards of ophthalmic practice to the practitioners. This might suggest low level of awareness of inherent practice health hazards among practitioners.

Types of Hazards
It includes projectiles, chemicals (splashes and fumes), and radiation (especially visible light, ultraviolet radiation and heat or infrared radiation).

Projectiles/Mechanical-A projectile posing a hazard to theeye can be of almost any size or shape, and it can travel ateither high or low velocity. Common projectiles in anindustrial setting might include pieces of a screwdriverblade, drill bit, grinding wheel, metal debris, rock, and steelrod. They can cause injuries ranging from corneal orconjunctival foreign bodies, to penetration of the eye, toblunt trauma. Some projectiles (especially metals) can betoxic to the eye. It comprises about 70 – 80 % of all work-related eye injuries.

Chemicals- The industrial environment often includes hazardous chemicals. In many cases, the major concern is injury caused by a liquid chemical that splashes into the eye; however, fumes, vapours, and dry chemicals can also besources of eye injury. Chemicals that could cause injury include acids, alkalis, organic solvents, and surfactants.

Radiation- The most common types of radiation encountered in industry are infrared radiation (IR) or heat, ultraviolet radiation (UV), and visible light. Sources ofIR in industry are primarily molten materials, specificallyglass and metals. Many industries are automated, so thatemployees are not exposed to large amounts of IR, butactivities such as glassblowing may produce significantexposures from low-level, long-term exposure (Oriowoetal., 1997). Epidemiological studies have demonstrated thatlong-term (chronic) exposure to IR in the glass and steelindustries is associated with the development of cataracts(Pitts and Kleinstein, 1993). Relatively few of the availablespectacle lens materials provide protection from infraredradiation. The best protector is a lens with a metallic coating(copper) that reflects IR (Pitts and Kleinstein, 1993).

Electrical Hazards- Electrocution may result in damage tothe central nervous system. In rare cases, an electric cataractcan be observed.

Other hazards: As like heat exposure in cookers, archexposure in welders, computer vision syndrome in computerusers, ocular infection in swimmers etc.

Occupational ocular problems in driving
Driving can be defined as the ability to operate, controlanddirect the course of vehicles. Normal visual functioningis an essential requirement for driving

- Drivers need to be able to judge the distance
- Read road signs and traffic lights
- Assists driver to respond to changes in environmentquickly and efficiently

Worksite Hazard

- Sources of motion that can create projectiles
- Employee movement patterns that could result in impactwith stationary objects
- Sources of heat that could cause injury or exposure toInfrareds radiation
- Chemical exposures
- Sources of dust
- Sources of UV, visible or other radiation
- The layout of the workplace
- Electrical hazards.

II. Material and Methods

A total of 200 Patients who were recognized as a case ofoccupational ocular hazards, were included in this cross-sectionalstudy conducted in the Department ofOphthalmology, Maharani Laxmi Bai Medical College,Jhansi, Uttar Pradesh, India over a period of 6 months fromApril 2019 to September.2019. The procedures followed were inaccordance with the ethical standards committee on humanexperimentation

(institutional or regional) and with theHelsinki Declaration of 1975, as revised in 2000. Thenecessary permission from the Ethical and ResearchCommittee was obtained for the study.

Inclusion criteria

The any patients of occupation hazards come in out-patients department of age group 20 to 60 years to be studied.

Both male and female patients were included in the study.

Exclusion criteria

- Injuries due to assault
- Accidental fall
- Road trafficaccidents

An assessment of present complaints, detailed clinicalhistory (present and past), and history of any ocularsurgery, occupation related history as like type of work,working environment, place, working hours etc. Age, sex,socio-economic status, was recorded.

Ophthalmologicalcheck-up as external examination of the eyes, visual acuity,torch light examination, slit lamp examination, Fluoresceineye staining, Schirmer's test, refraction, directophthalmoscopy, was done.

In case injury, B-scan, CT-scan,was also done.

III. Results

Table 1: Sex wise patients' distribution

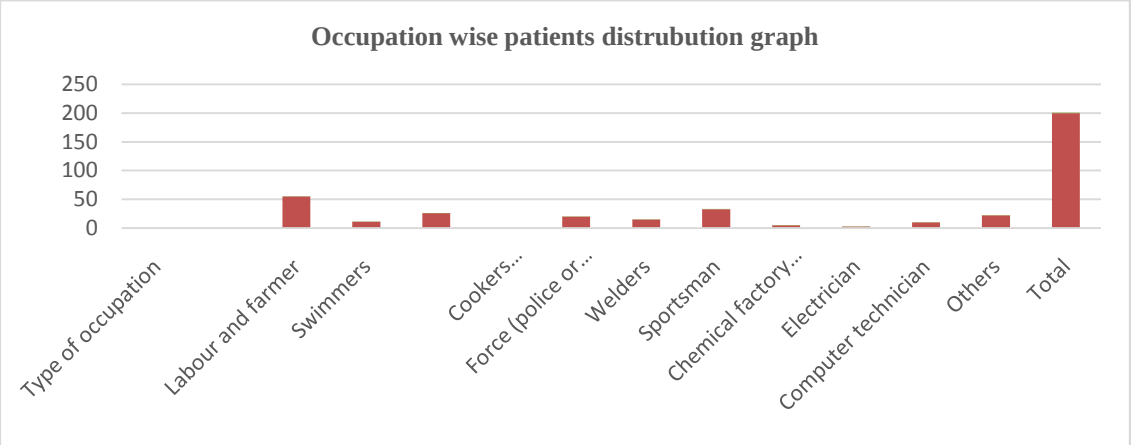
	Male	Female
No. of patients	140	60
Percentage (%)	70%	30%

Table 2: Age wise patients' distribution

Age groups (in years)	No. of patients	Percentage (%)
20-30	42	21%
31-40	76	38%
41-50	54	27%
51-60	28	14%
Total	200	100%

Table 3: Occupation wise patients' distribution

Type of occupation	Type of ocular hazards	No. of patients	Percentage (%)
Labour and farmer	Mechanical injury, chemical (insecticide) exposure	55	27.5%
Swimmers	Infectious and chemical exposure	11	5.5%
Cookers (housewife and professionals	Heat and smock exposure	26	13%
Force (police or army and fire brigade)	Mechanical and heat and smock exposure	20	10%
Welders	Arch exposure	15	7.5%
Sportsman	Mechanical exposure	33	16.5%
Chemical factory workers	Chemical exposure	5	2.50%
Electrician	Electric and arch exposure	3	1.50%
Computer technician	Eye strain	10	5%
Others	Mechanical, radiation, heat and electric exposure	22	11%
Total		200	100%



Graph 1.showing different type of hazard in study

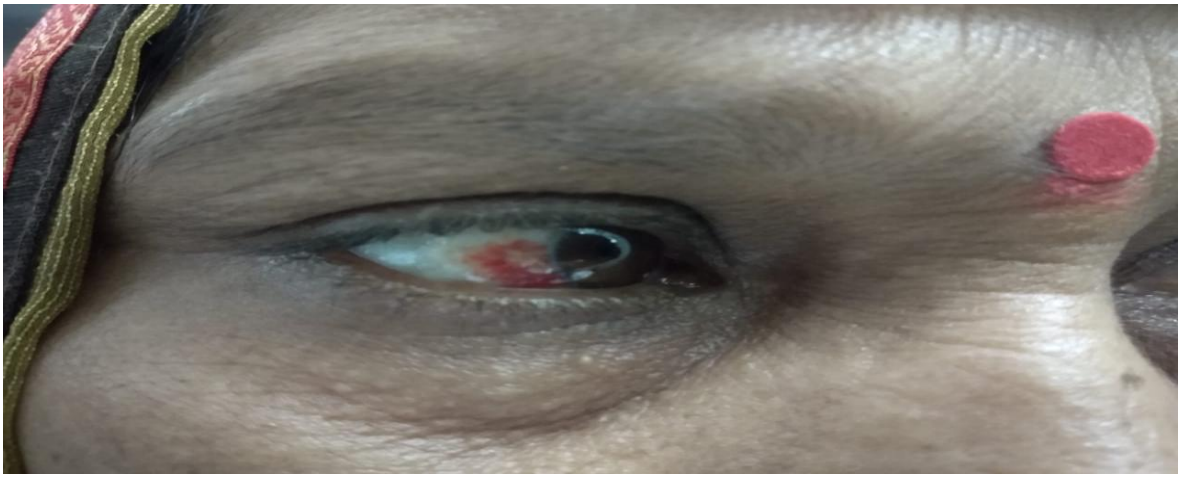


Figure1: -Right eye showing temporal conjunctival haemorrhage

IV. Discussion

Occupational ocular problems depend on-Nature of thework and Working environment. In our study the malefemale ratio was 2.3:1 (because of maximum outdoorworker are male) and most common affected age group was31-40 years (38%) followed by 41-50 years of age group(27%). Labour and farmer (27.50%) were more prone tooccupation ocular hazards because of 60-70 % population ofIndia depends on labourer, agriculture and livestock activity,followed by sportsman (16.55%) Most of the agriculturalworks involves use of agricultural tools, fertilizers,insecticides and pesticides. Almost 75% patients hadprimary ocular complaints of watering and redness of eyefollowed by itching and difficulty in vision and mostcommon sign was conjunctival congestion and subconjunctivalhaemorrhage (67.57%).

V. Conclusion

90 % of the occupational ocular hazards are preventable.Proper selection of protective eyewear depending on the nature of work and working environment helps in theprevention of potential eye hazards Ophthalmologists andother medical men not connected with industry often forgetto inquire into the occupational aspect of disease. In thediagnosis and treatment of eye injuries and diseases it ismost important to bear in mind the nature of the Patient'soccupation. This search for "occupational causes" is, in fact,all important. Whenever a case of eye disease is beinginvestigated, we not merely should search for a "septicfocus" but should always inquire into the workingconditions. Good visual acuity in addition to normal visualfield, good stereopsis, normal colour vision, eye coordination,good retinal adaptation is essential to avoid RTAs (Nwosu1989).

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