Occupational Hazards in Ophthalmology in Bundelkhand 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. An occupational 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. Community Ophthalmology was described as a new discipline in medicine promoting eye health and blindness prevention through programs utilizing methodologies of public health, community medicine and ophthalmology. The aim of study- To evaluate the various occupational ocular hazards in health settings and their causes, affected age group, signs/symptoms and prevention. A total of 200 Patients who were recognized as a case of occupational ocular hazards, were included in this cross-sectional study. The age group of the patients to be studied was between 20 to 60 years. An assessment of present complaints, detailed clinical history (present and past) and occupation related history as like type of work, working environment, place, working hours. Ophthalmological check-up as external examination 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 was 2.3:1 and most common affected age group was 31-40 years (38%). Labour and farmer (27.5%) were more prone to occupational ocular hazards. Almost 75.03% patients had primary ocular complaints of watering and redness of eye and most common sign was conjunctival congestion and subconjunctival haemorrhage (67.57%).

Keywords: Community Ophthalmology, Fluorescein eye staining, Occupational hazard, Schirmer's test, Slit lamp examination, Subconjunctival haemorrhage, 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. 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. 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. Occupational hazards 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. This is so as work related health hazards are potential sources of fear, psychological and emotional disturbance. It can be a source of discomfort, pain and disability. Moreover, vocational induced hazards may be life threatening and at times a cause of death. 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, infectious conjunctivitis, contact dermatitis, chronic headache, and visual disturbances. Generally, health care workers are exposed to an array of physical, chemical, biological, and psychosocial hazards. Viral hepatitis is a dreaded occupational health hazard among health personnel, 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...
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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 vocations paying little 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 the eye can be of almost any size or shape, and it can travel at either high or low velocity. Common projectiles in an industrial setting might include pieces of a screwdriverblade, drill bit, grinding wheel, metal debris, rock, and steel rod. They can cause injuries ranging from corneal or conjunctival foreign bodies, to penetration of the eye, to blunt trauma. Some projectiles (especially metals) can be toxic 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 be sources 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 of IR in industry are primarily molten materials, specifically glass and metals. Many industries are automated, so that employees are not exposed to large amounts of IR, but activities such as glassblowing may produce significant exposures from low-level, long-term exposure (Oriowo et al., 1997). Epidemiological studies have demonstrated that long-term (chronic) exposure to IR in the glass and steel industries is associated with the development of cataracts (Pitts and Kleinstein, 1993). Relatively few of the available spectacle lens materials provide protection from infrared radiation. 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 to the central nervous system. In rare cases, an electric cataract can be observed.

Other hazards: As like heat exposure in cooks, arch exposure in welders, computer vision syndrome in computer users, ocular infection in swimmers etc.

Occupational ocular problems in driving
Driving can be defined as the ability to operate, control and direct the course of vehicles. Normal visual functioning is 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 environment quickly and efficiently

Worksite Hazard
- Sources of motion that can create projectiles
- Employee movement patterns that could result in impact with stationary objects
- Sources of heat that could cause injury or exposure to infrared 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 of occupational ocular hazards, were included in this cross-sectional study conducted in the Department of Ophthalmology, Maharani Laxmi Bai Medical College, Jhansi, Uttar Pradesh, India over a period of 6 months from April 2019 to September 2019. The procedures followed were in accordance with the ethical standards committee on human experimentation.
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 traffic accidents

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

Ophthalmological check-up as external examination of the eyes, visual acuity, torch light examination, slit lamp examination, Fluorescein eye 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

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients</td>
<td>140</td>
<td>60</td>
</tr>
<tr>
<td>Percentage (%)</td>
<td>70%</td>
<td>30%</td>
</tr>
</tbody>
</table>

Table 2: Age wise patients’ distribution

<table>
<thead>
<tr>
<th>Age groups (in years)</th>
<th>No. of patients</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-30</td>
<td>42</td>
<td>21%</td>
</tr>
<tr>
<td>31-40</td>
<td>76</td>
<td>38%</td>
</tr>
<tr>
<td>41-50</td>
<td>54</td>
<td>27%</td>
</tr>
<tr>
<td>51-60</td>
<td>28</td>
<td>14%</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 3: Occupation wise patients’ distribution

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

Occupational ocular problems depend on-Nature of the work and Working environment. In our study the malefemale ratio was 2.3:1 (because of maximum outdoor worker are male) and most common affected age group was 31-40 years (38%) followed by 41-50 years of age group (27%). Labour and farmer (27.50%) were more prone to occupational ocular hazards because of 60-70% population of India depends on labourer, agriculture and livestock activity, followed by sportsman (16.55%). Most of the agricultural works involves use of agricultural tools, fertilizers, insecticides and pesticides. Almost 75% patients had primary ocular complaints of watering and redness of eye followed by itching and difficulty in vision and most common sign was conjunctival congestion and subconjunctival haemorrhage (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 the prevention of potential eye hazards. Ophthalmologists and other medical men not connected with industry often forget to inquire into the occupational aspect of disease. In the diagnosis and treatment of eye injuries and diseases it is most important to bear in mind the nature of the patient's occupation. This search for “occupational causes” is, in fact, all important. Whenever a case of eye disease is being investigated, we not merely should search for a “septic focus” but should always inquire into the working conditions. Good visual acuity in addition to normal visual field, good stereopsis, normal colour vision, eye coordination, good retinal adaptation is essential to avoid RTAs (Nwosu 1989).

References


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[7]. Musa AA, Akiode O, Tade AO. Persistently disturbing pattern of injuries from small scale industrial machinery.


[13]. Dannaker CJ, Maibach HI, Austin E. Allergic contact dermatitis to proparacaine with subsequent cross-sensitization to tetracaine from ophthalmic.


[17]. Osahon AI, Ukponmwan CU, Uhunmwangho OM. Prevalence of HIV seropositivity among patients with squamous cell carcinoma.