



SODIUM HYPOCHLORITE OCULAR INJURY IN COVID TIMES; OLD CHEMICAL, NEW BURDEN

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Introduction

Sodium hypochlorite is a chlorine based disinfectant, more commonly known as Bleaching powder. It is being used to disinfect various inanimate objects since the 18th century. Sodium Hypochlorite is a chemical compound with the formula NaOCl. It is a greenish yellow solution used in various dilutions.

Owing to its low cost, wide availability, easy constitution and most importantly a broad spectrum of anti microbial activity including its effectiveness on fungi and viruses, it is being widely used in Health Care Facilities for disinfection of floors contaminated with infected body fluids.^[1]

The number of cases attending ocular emergency for accidental splash of this alkali were only a count full and were majorly to the patients undergoing dental procedures or the dental surgeons who use this solution for intra canal irrigation owing to its anti microbial and tissue solvent properties.^[2]

A recent surge has been noted in Ocular Emergency due to NaOCl across the country. Corona virus disease 2019 (COVID-2019) is an acute respiratory disease caused by novel corona virus, transmitted via respiratory droplets, direct contact with cases and also through contaminated surfaces and objects. In order to break the transmission chain widespread sanitization drives are being held across the country using 1% NaOCl with the aim of disinfecting surfaces, people, cars.^[3] However the lack of proper protective gear people are inadvertently suffering eye injuries due to the chemical.

The patients experience stinging sensation in the eye along with reflex tearing, redness and photophobia. Sodium hypochlorite being an alkali causes protein denaturation in the superficial layers of the cornea and penetrate deeper causing devastating ocular sequel.^[4] It is an ocular emergency and needs immediate ophthalmic consult.

Materials And Methods

We retrospectively evaluated 28 cases of sodium hypochlorite ocular injuries from April 1, 2020 to May 10, 2020. Upon presentation all cases underwent vigorous saline wash for 20 minutes.^[5] Then ocular examination was done using Slit Lamp and visual acuity was noted. Each case was treated according to severity of disease. Age, Gender, Duration of presentation, grading of ocular injury and participation level was recorded from the pre-recorded data.

Results

In our study, the mean age of the patients was 27.25 +/- 12.78 years with range from 6-58 years. Age wise distribution of cases is given in table 1.

Table 1: Age wise Distribution

Age (Years)	No. of Cases
0-20	5
21-40	20
41-60	3
>60	0

Around 71% of the cases were of Age group 21-40 years (Table 1). They were mainly sweepers, cleaners, shopkeepers. Out of 28 cases, 20 were males and 8 were females. 12 cases were actively working with hypochlorite while rest 16 were bystanders only. All the bystanders were males of > 20 years' age (Table 2). Mean duration at which patient presented in the OPD or consulted telephonically (because of lockdown situation due to COVID-19) was 5.51 +/- 9.72 hours with range from 5 minutes to 48 hours.

Table 2: Baseline Demography

Variables	
Mean Age	27.25 +/- 12.78 years
Male/Female	20/8
OD/OS	16/12
Active Participation/ Bystanders	12/16
Mean Duration of Presentation/ Consultation	5.51 +/- 9.72 hours

Severity of the disease was assessed using Roper Hall classification (table no.3).^[6]

Table 3: Severity Grading

Grading	No. of Patients
0	22
I	4
II	2
III	0
IV	0

Most of the patients i.e 78.57% had only mild discomfort and redness (Grade 0) with no limbal ischaemia or corneal involvement. They were treated with lubricants and topical antibiotics for one week. 4 cases (14.28%) had corneal epithelial defect with no limbal ischaemia. These were simply treated with topical steroids, topical lubricants and topical antibiotics. 2 cases (7.14%) had accidental ocular injury while preparing the required concentration for sterilization. These people had Grade II ocular injuries. They were kept on close follow up with the treatment comprising of topical steroid, lubricants, topical antibiotics and a cycloplegic. In the end all cases recovered without any vision loss or other ocular sequel.

DISCUSSION

Chemical injuries accounts for upto 22% of ocular trauma. They represent one of the true ophthalmic emergencies wherein time is truly critical and management is started even

before the exact history is taken. As consistent with our study, various studies have reported that it is more common in adult men with an outdoor or industrial occupation.^[7,8]

In an event of chemical injury, bystanders are the most important people. They are at risk of accidental exposure to the chemical as well as they are the first responders to provide immediate care to the wounded.^[9] In our study, 57.14% cases were bystanders who were accidentally exposed. This stresses on using such chemicals with absolute caution.

0.1% of Sodium hypochlorite is being used for disinfection against the novel corona virus, which is a very low concentration and hence serious ocular injuries were not noted and were limited to mild redness and irritation.

However the appropriate concentration is only prepared by mixing NaOCl powder with parts of water and serious ocular injuries could result from wrong concentration of the chemical.

Since Corona Virus will stay with us for long and so will the NaOCl chemical, therefore it is absolute necessity of the hour to spread awareness about the possible ocular injuries caused by it and a need to get ophthalmologist consult without any delay.

The employers need to comply with their obligations to provide appropriate Personal Protective Equipment including eye goggles for the safety of the workers in service sector and the workers should be educated about the existing safety protocols.^[10]

Although it is an attempt to draw attention towards the effect of this chemical, a prospective study with larger sample size and longer follow up should be done to identify the long term consequences.

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