

Research Article

A Study of the Effects of Formalin on First Year MBBS Students

Yadav Abhijeet^{1*}, Yadav Mukul²

¹Assistant Professor, ²Professor & Head, Department of Anatomy, Bundelkhand Medical College, Sagar (M.P.), India

***Corresponding author**

Abhijeet Yadav

Email: dr.abhijeetrocks@gmail.com

Abstract: Formalin has been used as a preservative for cadaver in anatomy for years now. 1st year MBBS students are not accustomed to this chemical earlier and have various reactions when they come in contact with this. Therefore we in the department of Anatomy, Bundelkhand Medical College, Sagar planned to study the effect of formalin on 150 1st year MBBS students by giving them questionnaire. In our study 30% had unpleasant smell of formalin, 24.67% students have reported irritation and watering of eyes, others reported symptoms includes running or congested nose (20.67%), Sore throat (17.33%), headache (14.67%), skin problems (12%), lack of concentration (16.67%) and many more. Finding an alternative for formalin in the form of phenoxyethanol is also a good option.

Keywords: Formalin, 1st year MBBS students, Preservatives, Questionnaire, Symptoms

INTRODUCTION

Formaldehyde is colorless, flammable gas, extremely soluble in water; the aqueous solution (about 37% formaldehyde) is called formalin. It is widely used in medical colleges and hospitals, as preservative, disinfectant, embalming solution and in different fields like wood and plastic industries. Although formalin is extensively used in different fields, its toxicity is frequently ignored [1]. A cadaver is embalmed via the infusion of chemical substances that include formalin (which contains formaldehyde), alcohol, glycerin, carbolic acid, and dye. Those substances have specific roles and they are usually infused via the femoral arteries or the internal carotid arteries [2].

Adverse effects of inhaling formaldehyde becomes more as the concentration level of it increases. The common symptoms from acute exposure to formalin manifest as irritation of the throat, nose, eyes and skin. It can also cause neurophysiologic effects, irritation of upper respiratory tract which can potentially exacerbate asthma symptoms and other respiratory illnesses, also dyspnea, coughing, burning of nose, eyes, pharynx. Chronic exposure can cause bronchitis and pneumonia. When it is swallowed, it can result in sudden death. Some researcher also believes that formaldehyde is a potential carcinogen [11].

MATERIALS AND METHODS

150 1st year MBBS students from Bundelkhand Medical College, Sagar were given questions relating to symptoms that developed following exposure to formalin fixed cadavers.

RESULTS AND DISCUSSION

The results of formalin on 1st year MBBS students are given in Table-1. 67% students have reported irritation and watering of eyes. Other symptoms includes irritation in the throat in 17.33%, tingling sensation in nose in 20.67%, skin problems in 12%, lack of concentration in 16.67%, headache in 14.67% students.

The toxic effects of the formalin can be reduced by using hand gloves, mask while doing dissection of cadavers but there was not so much reduction in the symptom irritation and watering of the eyes by using the spectacles [3].

Formaldehyde causes degenerative, inflammatory and hyperplastic changes in the mucosa of the target organ. The absorption it is converted to formate by the enzymes in erythrocytes. Formate can cause cross linking of nucleic acids and amino acids that results in cell death. Finally formate is oxidized to carbon dioxide and is excreted via exhalation [11].

Arterial injection is the lowest exposure procedure in the embalming operation and has the least impact on total overall exposure values. According to some researchers ethanol glycerin fixation with thymol conservation can be a potential alternative to formaldehyde and phenol embalming [5].

Farah et al in their study have found that in the expose group 88 percent subjects suffer from eye

irritation, 74 percent suffers from nose irritation, while 29 percent suffers from throat irritation and 21 percent from airways [6].

Increase formaldehyde concentration causes dose related symptoms like dryness in the nose, throat and conjunctiva [7]. Biological effects associated with formaldehyde usage certainly discourage most of the

students from coming to dissecting room, even complete withdraw from the programs in some cases [8]. Cancer risk is more among embalmers and industrial workers exposed to formaldehyde [9]. Phenoxyethanol, an oily liquid with a density of about 1.1 g/ml [10] is now replacing formalin in many preservation techniques of anatomy.

Table-1: Effects of Formalin on First Year MBBS Students

| Sl. No. | Symptoms | Number of students affected out of 150 | Percentage (%) |
|---------|---|--|----------------|
| 1. | Unpleasant smell | 45 | 30 |
| 2 | Excess lacrimation | 37 | 24.67 |
| 3 | Sore throat | 26 | 17.33 |
| 4 | Running or congested nose | 31 | 20.67 |
| 5 | Skin problem eg. Itching, sore skin on hands, burning sensation | 18 | 12 |
| 6 | Lack of concentration | 25 | 16.67 |
| 7 | Headache | 22 | 14.67 |
| 8 | Disturbance of sleep | 6 | 4 |
| 9 | Disturbance of sight | 5 | 3.3 |
| 10 | Unusual tiredness or dizziness | 38 | 25.3 |
| 11 | Nausea | 14 | 9.3 |
| 12 | Gastrointestinal disturbances | 8 | 5.3 |

CONCLUSION

Formaldehyde remains a popular choice of tissue fixative despite of its toxic effects because of its effectiveness, low cost, and consistent results. We need to follow precautionary measures so as to reduce the toxic effects of formalin. But It is now high time to switch ourselves to a better and much safer preservative.

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