

Research Article

A study on side effects of formalin on First Year MBBS students of Government Medical college, Baramulla.

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ABSTRACT

Background:

Formalin is the most widely used preservative used for the preservation of cadavers as a whole and it is also used for preservation of organs in containers as well. It is known for its carcinogenic properties & skin allergies but still in use worldwide in all the anatomy labs because of its marvellous properties of fixation of tissues & act as a potent antimicrobial agent. It has its adverse effects on the students and teachers as well. It usually has an impact on skin, by acting as a chronic irritant. Respiratory system can get affected because of the formaldehyde fumes, being more severe in individuals with allergic history.

Aim:

To evaluate the harmful effects that formalin has on exposed medical students.

Materials and Methods:

Our study was an observational, cross sectional study. This study was conducted on first year students (batch 2024-2025) of Government Medical College, Baramulla. The number of students included in the study were 100. Data was generated using a set of questionnaires covering details pertaining to exposure characteristics and symptoms reported by a particular person.

All the students were tested for allergy profile and then only the study was conducted.

Results:

Unpleasant and disturbing smell of the formalin was the most common reported symptom followed by eye irritation, soreness of oropharyngeal mucosa. Respiratory symptoms were observed in students and it was very disturbing for the students.

Conclusion:

Formaldehyde has an impact on the quality of work of students who are being taught in the Dissection Hall for hours. Irritant formalin has many toxic effects on the medical students. Proper exhaust fan facility, proper ventilation and adoption of minimal exposure measures must be adopted by the teachers for their students to minimize the toxicity of formalin.

Keywords: Formalin, Questionnaire, Toxicity, Dissection Hall, 1st Year MBBS Students.

Introduction:

Formalin is aqueous solution of 37% formaldehyde used widely in all the medical colleges for the preservation of dead bodies i.e. cadavers. It is an embalming solution which is used for the preservation of dead bodies especially in cases of dead bodies being transported for long distances to prevent their decaying and putrefaction. As the embalming fluid has formaldehyde as the main component, so it acts as germicide ensuring that no infection gets transmitted to the person that comes in contact with the dead body. Its extensive use in different domains of anatomy, often leads to the negligence towards its toxic effects (1,2). The embalming substance is infused via femoral arteries usually and internal carotid arteries also, preventing the decomposition & contamination by insects & maggots (3).

Formaldehyde, a colourless gas, with inflammable property & unpleasant odour was discovered in 1876 by August Wilhelm Von Hofman who was a chemist (4).

Due to its widespread use in Anatomy Dissection Halls, it poses a continuous threat to the health of teachers as well as students (5).

Poor ventilation in the dissection halls lead to high exposure. Similarly, its use should be made cautiously because its spillage can also increase exposure load (6).

Its side effects are vast ranging from eye irritation, throat irritation to neurophysiological effects. Moreover, respiratory compromise in the form of dyspnea, cough, pharyngitis, bronchitis and even pneumonia can occur. Its ingestion can lead to death (7).

Materials and methods

The present study was conducted on First Year MBBS students of Batch 2024-2025. It was conducted in Government Medical college, Baramulla, J&K. Students were explained about the aim of our study. In total 100 MBBS students were involved in the study. Fortunately, not even single student was having any specific allergic history. It was an observational, cross sectional study. A questionnaire having 15 symptoms was given to the students after 01 month of beginning of their dissection classes. They were guided to mark their response and return the questionnaire, the next day.

Results:

The results of formalin associated side effects on MBBS students of first year M.B.B.S. are tabulated in Table 1.

Among 100 students, the common most symptom was that of pungent, offensive & irritating smell of formalin that was seen in 57% of students. Irritation of the eye was observed in 36% of students. They faced irritation and watering of eyes that persisted for a long time. Sore throat & nasal mucosal congestion was seen in 29% & 25% of students respectively. There were other problems that were associated with the use of formalin like skin problems, neurophysiological problems etc and the percentage of students affected was tabulated in Table 1.

Table1: Effects of Formalin on Students of 1st Year MBBS.

S. No.	Symptom	Affected students Percentage
1.	Pungent, Irritable, unpleasant Smell	57
2.	Irritation of eyes	36
3.	Soreness of Oropharyngeal mucosa	29
4.	Congestion of Nasal mucosa	25
5.	Dermatological Problems- rash, itching etc	17
6.	Lack of concentration	20
7.	Headache	22
8.	Sleeping disturbances (Insomnia)	05
9.	Problem of Vision	05
10.	Dizziness and inactive behaviour	25
11.	Retching	12
12.	Gut disturbances	08
13.	Dryness of nose with crusting	05
14.	Coughing	27
15.	Breathing Issues	20

Discussion:

As the MBBS students stay in the Dissection halls for 06 hours in a week, it poses a continuous threat to their health. It can be overcome by using gloves, masks and spectacles or goggles. Formaldehyde can cause hyperplastic changes in mucosa of various organs. It can cause degenerations & inflammation. Its absorption causes cell death (7).

Carcinogenic potential of formalin poses a threat to people who are involved in embalming. Heart diseases are noticed in people dealing with formalin for a long time (8) .

In spite of having so many side effects, formaldehyde. is a preferred agent because of its marvellous results & cost effectiveness (9) .

In our study, it was seen that most common symptoms were pungent smell (57%), irritation of eyes (36%) which was in coherence with the study of Dr. D. Dixit et al (2). Our finding of unpleasant, pungent smell which was hugely put up by students coincides with the findings of Noha Selim Mohamed Elshaer (9).

Farah et al in their study suggested that eye irritation was seen in 88% of students, 74% had nasal irritation while as 29% had throat irritation (10).

Increased severity of symptoms is based on increased absorption & inhalation of formalin. Cadaveric handling lectures & lecture based on proper use of formalin should be imparted to students. Phenoxo ethanol can be seen as a best replacement for formalin (11, 12, 13)

Conclusion:

Formaldehyde is used excessively in Anatomy Labs despite its harmful side effects. Cadavers embalmed with formalin act as a rich source of information to students. So careful approach of students and teachers is needed. It's our moral duty to make our students aware about its side effects. All preventive measures like use of gloves, masks, goggles should be encouraged both at the level of students as well as teachers. Fully equipped dissection halls with exhaust fans should be established. Dissection Hall staff should be well versed with its side effects such that they can prevent its spillage. It is better if we go for other safer embalming agent for the betterment of our students.

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