

Toxicological Emergencies, Present MBBS Curriculum and Preparedness of Medical Students – An Observational Study

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Abstract: Toxicology deals with action, toxicity, fatal dose, signs and symptoms, detection and treatment of poisoning. Forensic toxicology deals with the medicolegal aspects of poisoning. Toxicology related cases comes under 3 most common medico-legal emergencies in India making it must know subject for medical students. Present study shows that weightage given to toxicology in MBBS curriculum does not incorporate enough knowledge in medical students.

Keywords: Emergency, Medico-legal, Toxicology

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I. Introduction

The term poison means any substance in any form, entering in to a living body through any route or coming in contact with the body surface that will produce ill health or death by its local or remote action. Poisoning is a significant global public health problem. According to WHO data, in 2012 an estimated 193,460 people died worldwide from unintentional poisoning. Of these deaths, 84% occurred in low and middle-income countries. In the same year, unintentional poisoning caused the loss of over 10.7 million years of healthy life (disability adjusted life years, DALYs).[1] Considering the above points it becomes necessary for a medical graduate to have minimum acceptable knowledge of toxicology and its medicolegal aspects. In MBBS curriculum toxicology and its medicolegal aspects are covered in the second year. In this study we have made an attempt to know whether weightage given to toxicology in MBBS curriculum is justifiable or not.

II. Material And Methods

In this study following points were examined in details.

1. Second year MBBS forensic theory examination papers of different universities: Average number of questions asked on toxicology in each university examination and whether they are sufficient to test toxicology knowledge of students.
2. Data obtained from interaction with students
3. Profiling of toxicology related cases in different parts of India.
4. NCRB data on poisoning cases

All of the above parameters are systematically studied to determine usefulness of current MBBS curriculum for incorporating knowledge of toxicology in medical students.

III. Result

University question papers of forensic medicine and toxicology: Apart from the authors current working university, 3 more universities were selected and their past four year university exam papers for FMT are studied in detail for toxicology content.

- a) MPMSU Jabalpur university b) RGUHS Bengaluru university c) MUHS Nasik d) KUHS Kerala

MPMSU Jabalpur University

Year	Q on toxicology	Q on FM	Total marks	Average questions asked on toxicology
2017 (W)	2 Marks	38 Marks	40	18.75%
2017 (S)	5 Marks	35 Marks	40	
2018 (W)	11 Marks	29 Marks	40	
2018 (S)	12 Marks	28 Marks	40	

Table1

RGUHS Bengaluru University

Year	Q on toxicology	Q on FM	Total marks	Average questions asked on toxicology
2008	11 Marks	89 Marks	100	17.75%
2013	20 Marks	80 Marks	100	
2015	20 Marks	80 Marks	100	
2017	20 Marks	80 Marks	100	

Table 2

MUHS Nasik University*

Year	Q on toxicology	Q on FM	Total marks	Average questions asked on toxicology
2014	8 Marks	24 Marks	32**	26%
2015	10 Marks	22 Marks	32**	
2016	10 Marks	22 Marks	32**	
2017	6 Marks	26 Marks	32**	

Table 3

* Seven out of nine questions are compulsory. On an average only two questions were asked on toxicology.

* **8 Marks of MCQ could not be added here as MCQ papers were not available

KUHS Kerala University

Year	Q on toxicology	Q on FM	Total marks	Average questions asked on toxicology
2015	4 Marks	36 Marks	40	15%
2016	9 Marks	31 Marks	40	
2017	11Marks	29 Marks	40	
2018	0 Marks	40 Marks	40	

Table 4

2. Response from subjects who have completed their 2nd year MBBS

- 100% students said that they have not read toxicology in detail during 2nd year
- The Most common reason for not reading toxicology was insufficient weightage in the examination
- 90% students said reading toxicology and FM together for examination is difficult and FMT paper should be divided in to paper 1 for Forensic pathology and paper 2 for clinical aspect of FM and toxicology

3. National crime records bureau data (please see discussion)

4. Profiling of medicolegal emergencies in different parts of India (please see discussion)

IV. Discussion

Toxicology is taught in the MBBS curriculum during 2nd year. As almost all cases of toxicology are medicolegal, it is taught along with forensic medicine. It helps clinicians in collecting important evidences while managing toxicology case.

Commonest medicolegal emergencies in India:

NCRB data for accidental and nonaccidental deaths in India for the year 2014 and 2015 (Table 5). [2]

Cause	Year 2014	% share (w.r.t. all India)	Year 2015	% share (w.r.t. all India)
Poisonous liquor	1699	1.5	1522	2.3
Poisoning	20587	17.9	26173	39.1
Drug overdose	874	0.8	750	1.1
Total	23160	20.2%	28445	42.5%

Table 5

Profiling of medicolegal emergencies from different parts of India (Data for most common 5 medicolegal cases are given here)

Researcher and place	Toxicology	RTA	Assault	Fall from height	Trauma	Burns
Yatoo et al (Srinagar, JK) [3]	9.24%	48.08%	30.63%	2.81%	1.05%	3.08%
Mina et al (New Delhi) [4]	23.10%	8%	13.33%	3%	16%	2.5%
Tomar et al (Indore,MP) [5]	9.21%	57.70%	8.02%	10.13%	5.70%	3.23%
Tasgaonkar et al (Murud,MH) [6]	8%	8.49%	21.23%	3.30%	-	1.42%
Deelip Kumar et al (Tumkur, KA) [7]	14%	41.6%	21.96%	5.2%	12.13%	0.57%
Malik et al (Haryana) [8]	42%	36.6%	22%	0.5%	-	6.9%

Visnurajkumar et al (Puduchery) [9]	18.9%	39.1%	9.4%	3.6%	3.3%	1.5%
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Table 6

From above data it is clear that toxicological cases come under most common 3 major medicolegal emergencies, thus making knowledge of toxicology important for every medical student. When only paediatrics is taken into consideration, poisoning is the most common medicolegal emergency.[4] As the Indian education system is exam based, the main aim of almost 90% students is to get pass. As shown in result section, paper set for FMT by different universities examines only 20% of toxicology on an average with repetition rate of questions almost 50%. So students are more inclined to not to read toxicology at all or read only repetitive questions instead of focussing on gaining sufficient knowledge of toxicology.

V. Conclusion

Present MBBS curriculum is insufficient to incorporate sufficient toxicology knowledge in medical students.

Few recommendations:

- At present FMT examination is conducted in only one paper, it should be divided into two papers I and paper II
Paper I- Forensic pathology
Paper II- Clinical aspects of FM and Toxicology
- Establishment of clinical forensic unit attached to casualty
- Compulsory 15 day internship in clinical forensic and poison ward
- One permanent faculty for clinical forensic unit in addition to present MCI requirement for FMT department

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