



A Study of Trend of Animal Experimentation in Medical Education in India

Jaswant Rai, Amandeep Singh

Abstract

A debate on the continuation or discontinuation of animal experiments in pharmacological practical teaching of medical undergraduates is still in progress. The present study has been done to know the current status of animal experiments in medical education in India using structured questionnaire. 81.25% pharmacologists and 74% of the medical graduates and clinicians favour the continuation of animal experiments, preferably with the refinement or reduction of use of animals. Animal based experiments play a pivotal role in pharmacological teaching and research in India. However the pattern of practical pharmacology teaching is not uniform and specific guidelines should be framed to ensure uniformity.

Key Words

Pharmacology, undergraduate, practical, animals experiments.

Introduction

For the last few decades, use of animals in experiments has become controversial. One school of thought is that animal experimentation results in cruelty to animals, and of no use to the medical students in later life beside being expensive. They insist that animal experiments in pharmacological teaching should be banned and that they should be replaced with other alternatives (1). Others, however, say that animal experiments help to impart hands-on training to students, reinforce their knowledge from lectures and textbooks, and contribute to the development of newer drugs and vaccines (2). Even it has been reported that out of papers presented in two annual conferences of Indian Pharmacological Society (IPS) and published in the journals of Indian Journal of Pharmacology (IJP) during 2002 and 2003, 68.21% of papers were based on animal experiments (3). Thus, the present study was planned to know the ongoing trend of animal experimentation in pharmacology practical training and research in medical institutes.

Material and Method

Two surveys regarding opinion of pharmacologists and

clinicians on the use of animals in pharmacology practical teaching in different medical institutes have been conducted separately.

A survey was conducted in the Department of Pharmacology at Government Medical College, Amritsar wherein proformas containing questions ranging from pattern of undergraduate practical teaching to the opinion of pharmacologists about animal experiments, were sent in self-addressed envelopes to 33 medical institutes (i.e. teaching hospitals) in India. 16 medical institutes of seven states and two union territories of India gave feedback (Table.1). Thirty-two pharmacologists (with an average of 2 pharmacologists per institute) took part in the survey.

Another proforma querying about the opinion on use of animals in pharmacology practical teaching was personally got filled from 50 medical graduates and clinicians from different medical institutes.

Results

Eight (57.14%) of the 14 medical institutes imparting only undergraduate training are continuing with animal experiments as such. Five institutions i.e. 35.7% are

From the Departments of Pharmacology, Government Medical College, Amritsar - 143001 (India)

Correspondence to : Dr. Jaswant Rai, Professor & Head, Dept. of Pharmacology, Govt. Medical College, Amritsar - 143001 (India)



continuing with the animal experiments with partial use of other alternatives. One (7.14%) of these institutes has completely discontinued the use of animal experiments and have replaced them with animal alternatives. 81.25% Pharmacologists and 74% of the medical graduates and clinicians favour the continuation of animal experiments, preferably with the refinement or reduction of use of animals (Table 2, 3). This study has also revealed that undergraduate pharmacology practical teaching is not uniform (Table 4). An important observation unrelated to the study objective was made in the present study that non-uniformity in names of pharmacology department exists across the country (Table 5).

Table 1 A list of 16 Medical Institutes

States Institutes

1. Sri Guru Ram Dass Medical College, Amritsar (Punjab).
2. Guru Gobind Singh Medical College, Faridkot (Punjab).
3. Govt. Medical College, Amritsar (Punjab).
4. Govt. Medical College, Rohtak (Haryana).
5. A.S.C. Medical College of Medical Sciences & Hospital, Jammu.
6. S.M.S. Medical College, Jaipur (Rajasthan).
7. Govt. Medical College, Ajmer (Rajasthan).
8. M.P. Shah Medical College, Jamnagar (Gujarat).
9. B.J. Medical College, Ahmedabad (Gujarat).
10. V.P. Chest Institute (Delhi).
11. University College of Medical Sciences (Delhi).
12. L.L.R.M. Medical College, Meerut (Uttar Pradesh).
13. J.N. Medical College, Aligarh (Uttar Pradesh).

Union Territory Institutes

14. PGIMER (Chandigarh).
15. Govt. Medical College (Chandigarh).
16. J.I.P.M.E.R. (Pondicherry).

Table 2 Opinion of pharmacologists about animal experiments for teaching (n = 32).

Opinion	% Response
Continue as such	15.62
Continue either with refinement / reduction of use of animals	65.63
Discontinue for undergraduates only	18.75

Table 3 Opinion of medical graduates and clinicians about animal experiments for teaching (n =50).

Opinion	% Response
Continue as such	4
Continue either with refinement / reduction of use of animals	70
Replace with alternatives	18
Discontinue for undergraduates only	8

Table 4 Alternatives Used In Undergraduate Institutes (n=14).

Alternatives	Number of institutes
Computer aided learning (CAL)	5 (35.7%)
Simulated case studies	1 (7.14%)
Clinical project work	2 (14.24%)
Demonstration of graphs, charts, tables	2 (14.24%)
Clinical exercises	1 (7.14%)

Table 5 Non- uniformity in name of Department of Pharmacology.

Name	Medical Institute
I. Clinical Pharmacology	Seth G S Medical College, Mumbai. T N Medical College, Mumbai.
II. Pharmacology and Therapeutics	Goa Medical College, Goa.
III. P.G Deptt. of Pharmacology and Therapeutics	Government Medical College, Jammu
IV. Clinical Pharmacology and Therapeutics	Nizam's Institute of Medical Sciences, Hyderabad.

Discussion

Animal experiments are the backbone of pharmacology practical teaching, which has become controversial. A survey involving three medical institutes of Delhi has reported that 32% students and 45.7% medical teachers favour the continuation of animal experiments (4). In present study, 81.25% experts in Pharmacology and 74% of medical graduates and postgraduates of other clinical specialties have favoured the continuation of animal experiment with reduction in number and refinement of experiments.

A metanalysis evaluating 763 research papers presented in the Oral and Poster presentations during the three annual Conferences of Indian Pharmacological Society held at Gwalior, Delhi and Kolkata during the year 2002, 2003 and 2005 respectively; and 238 publications in the journals of IJP during the last five years, i.e. from 2000-2004 was carried out. 77.33% of research papers presented in three conferences of IPS and 91.6% papers published in IJP issues of five years involved animal experiments point towards importance of animal experimentation in research done in our country by pharmacologist, hence, it further strengthen our finding (Table 6).



Table 6. Analysis of IPS Conferences & IJP Journals

	Total Paper	Total publications
	763	238
Animal experiments	590 (77.33%)	218 (91.6%)
Clinical experiments	173 (22.67%)	20 (8.40%)

The advantages of continuation of animal experiments in pharmacology practical teaching include : To acquaint students with certain principles of drug action and mechanism of action as is admitted by 59.6% students and 65.7 % teachers in one study (4). Application of experimental information in clinical conditions will be more useful and fruitful during clinical practice. Bio-therapeutics (i.e. treatment with living organisms, e.g. use of leeches for reattachment of a body part, maggots for debridement of dead tissues) is new upcoming field has further authenticated need of animal experiments in pharmacology practical teaching. Without prior exposure to animal experimentation, one may find it difficult to use living organisms in therapeutics (5).

No doubt, animal experimentation is associated with problems of high cost, difficult procurement, handling and disposal of animals, the legal bindings of maintaining animal house of approved standards, requirement of skilled persons, and is also time consuming. All these factors favour the use of Computer assisted learning (CAL). Moreover, it is time saving as many experiments can be demonstrated in a short time, experiments can be observed repeatedly without loss of animals, avoids use of animals and has high acceptance due to change from routine practicals. Above all, CAL is easy to do and tension free in comparison to animal experiments.

But the drawbacks of CAL are its high cost and non-availability at most of the medical institutes as is evident from the fact that only 5 out of 14 institutes are using it (Table 6). In present circumstances, proper utilization of pharmacology practical hours especially without animal experimentation and non-availability of CAL has become a major problem. This has led to inclusion of simulated case studies; clinical project work; demonstration of graphs, charts, tables; clinical exercises in pharmacology practical teaching in different medical institutes as is evident in present work (Table 6) thereby causing non-uniformity.

The results of present study point towards continuation of animal experiments with refinement and reduction in number, and non-uniformity in pharmacology practical teaching and names of department.

Recommendations

The curricula for pharmacology practical teaching should be made uniform all over the country and uniformity in names of department should be ensured.

References

1. Barnard ND., Kaufman SR. Animal research is wasteful and misleading. *Scientific American* 1997 ; 276 : 80-82.
2. Botting JH, Morrison AR. Animal Research Is Vital to Medicine. *Scientific American* 1997 ; 276 : 83-85.
3. Singh A, Rai J, Sharma G, Dhingra MS. A study of pattern of pharmacological research in India. Presented at annual conference of Indian Pharmacological Society at Kolkata, West Bengal-India, 2005 ; 14-15.
4. Roy V, Tekur U. Animal experiments in medical undergraduate curriculum. A teacher student perspective. *Ind J Pharmacol* 2001 ; 33 : 104-07.
5. Carol M. Ostrom. Leeches, maggots and parasitic worms can play healing role. *Seattle times*, 4 August, 2004. http://seattletimes.nwsourc.com/html/health/2001995746_healthleeches04.html. [accessed 20 August 2004].

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