

A structured course in laboratory animal science for postgraduates: Is it a necessity?

Sir,

Animal experiments (AE) are an important element in the training of postgraduates in pharmacology and other disciplines. Use of animals in various basic medical science programs for education and experimental research has been largely criticized on the grounds of animal rights, poor ethical consideration, and inability to follow guidelines laid down by various agencies for maintaining and handling laboratory animals. It may not be true in all instances but is a subject of serious concern.

The utilization of AE in biomedical research demands a certain level of knowledge and manual dexterity in the scientists conducting the research. There is a wide diversity in the postgraduate curricula with respect to animal experimental knowledge and skills in the different medical colleges of India. Despite several postgraduate institutes in the country having a well-defined curriculum for AE, the “actual” curriculum followed is a trace of what is actually defined. Hence, the required level of expertise is often not obtained by the students. Moreover, the problems are compounded by the difficulty in attaining animals and strict regulations limiting their use.^[1] As such, several attempts have been made to eliminate animals from the laboratory scene. However, they shall always remain an integral part of medical research for providing useful biological information as the intact animal usually provides a suitable model to study the complex interactive processes in the human body, which can be extrapolated and translated to human advantage.

If we expect proper utilization of laboratory animals in research, we need to address the issue at a very basic level, i.e., during postgraduate training when the candidate is first exposed to these experiments to develop appropriate skills in the area of expertise. However, most candidates are naive to the basic requirements of animal experiments. We need to familiarize and sensitize the young scientists to respect animal life and appreciate their contribution in development of medical science. Appropriately designed AE with a strong statistical underpinning and with ideal conditions of animal care, which lessen stress or pain, often generate more reliable results.^[2] The absence of reporting of ethics and complete statistical aspects in animal experimental research in certain medical journals in India^[3] indicate that most of our scientists are unaware of these pertinent facts or don't

consider it of any importance while reporting. The ethical and scientific validity of the research, especially animal based, ought to be seriously considered. If this is ignored at this initial stage, it may become critical and the root cause for the criticism of standards and guidelines followed subsequently.

The implementation of the 3Rs (Replacement, Reduction, and Refinement) in biomedical research and medical education has been globally accepted. However, in India only a few organizations such as Mahatma Gandhi-Doerenkamp Center for Alternatives to Use of Animals in Life Science Education, I-CARE, People for Animals, PETA India, JIPMER (Pondicherry) and InterNICHE are actively involved in propagating the use of alternatives to AE.^[4] This leads to the assumption that most of our postgraduate students are under-exposed to the concept of 3Rs, which needs to be addressed.

In view of the aforesaid, we advocate a pre-entry course in Laboratory Animal Science (LAS) for all postgraduate programs utilizing animals for biomedical research. This will sensitize the researchers regarding the ethical issues as well as handling of animals.

The objectives of this course will be to develop greater insight, confidence, competency, and responsibility in the students in their approach towards the use of animals for scientific purpose. We envision this course to be of basic level describing the fundamental aspects of LAS. Additional training for specialized surgery, special techniques on different species can be obtained through inter-institutional collaboration with experienced researchers. This course will hopefully inculcate an attitude of respect towards laboratory animals in the young scientists and train them to design AE based on highest possible scientific and ethical standards keeping in line with the 3Rs concept.

The main *desiderata* of the curriculum for this course can include the biology and husbandry of laboratory animals; microbiology and disease; health hazards and safe practices in the animal house; efficient experimental design, conduct and appropriate statistical analysis; anesthesia, analgesia and experimental procedures; alternatives to animal use and principles of the 3Rs; ethics of the use of animals or animal tissues in research; legislation; analysis of scientific literature dealing with animal studies.^[5] We suggest that the premier institutions of the country (with the technical know-how and the required infrastructure) should conduct this LAS course for a duration of 2-3 weeks depending on the availability of resources and teaching faculty. A combination of didactic lectures and practical hands-on sessions would be ideal. All the experimental procedures must be ethically performed as per recommended guidelines. Practical sessions can be

Letter to the Editor

conducted in the following progressive manner:

- Video viewing sessions on handling, restraining animals humanely and different techniques for sampling/administration of drugs
- Step wise demonstrations and practice on plastic dummies
- Demonstrations of the techniques on live animals
- Replication of the techniques by the students under supervision.

The attendees must be introduced to national regulations regarding use of laboratory animals by organizations such as Indian National Science Academy (INSA); Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) and Indian Council of Medical Research (ICMR). International guidelines for reporting of research using animals (ARRIVE guidelines) should also be known. The faculty conducting this course should involve not only pharmacologists, but also experts from veterinary and biomedical sciences and organizations involved in preclinical studies. A student handbook providing all course details and resources for reference is recommended. As assessment drives learning, all attendees must undergo a summative examination on completion of the course.

The anticipated outcomes of this LAS course are:

- Enhanced knowledge and technical skill in AE
- Superior quality of the scientific output with reduced variance in research results
- Better understanding of the 3Rs concept and awareness of the current alternatives
- Implementation of the 3Rs in the designing future research
- Reduction in animal use
- Ethical considerations during the conduct of AE
- Sharing of expertise and resources among institutions
- Opportunities to interact with organizations and experts advocating 3Rs
- Fulfilment of international training requirements for scientists intending to do biomedical research involving animals.

We are conscious of the fact that there may be practical difficulties in initiating this course, which may be financial, technical, or related to logistics. However, we call upon the premier government and private institutions to be trendsetters in this direction. Although a course is being offered by National Centre for Laboratory Animal Sciences on an adhoc basis, not much progress has been done on this aspect in the country despite the recommendations by INSA and CPCSEA.

In most of the European countries, courses based on the Federation of European Laboratory Animal Science Associations (FELASA) guidelines are mandatory for scientists intending to do biomedical research involving animals.^[5] Participants of these courses have given good feedback with more than 98% of the students regarding the course as indispensable for all scientists using animals in biomedical research as a means to increase knowledge, develop technical skills, and also to raise awareness to ethical aspects of

the use of animal models of research.^[6] We propose that these guidelines can be utilized in the framing of curriculum of the advocated LAS course.

With the increasing number of private colleges offering Postgraduate courses it is mandatory that regulations be clarified about the ethical use of animals in training. Just as the training in research methodology is imperative for postgraduates, similarly we deem it essential that they be fully trained in LAS. As the new Medical Council of India (MCI) law has made research publications mandatory for promotions, this course will go a long way in generating superior quality animal research publications.

A curb on improper use of laboratory animals is currently the need of the hour in our postgraduate programs. Thus, a well structured LAS course, which educates and trains the researchers, will show the way forward. We recommend that this course be made mandatory for all postgraduate students pursuing degree in basic and allied health sciences. This will equip them with the knowledge and skills to plan their AE in the most efficient manner with minimum harm to laboratory animals.

Syed I. Shehnaz, Anoop K. Agarwal

*Department of Pharmacology, Gulf Medical University,
Ajman, United Arab Emirates*

Address for correspondence:

Syed Ilyas Shehnaz, Department of Pharmacology,
Gulf Medical University, P.O.Box: 4184,
Ajman, United Arab Emirates.
E-mail: shehnazilyas@yahoo.com

REFERENCES

1. Solanki D. Unnecessary and cruel use of animals for medical undergraduate training in India. *J Pharmacol Pharmacother* 2010;1:59.
2. Flecknell P. Replacement, reduction and refinement. *ALTEX* 2002;19:73-8.
3. Jaykaran, Yadav P, Kantharia ND. Reporting of method of animal sacrifice in articles published in Indian journals. *J Pharmacol Pharmacother* 2011;2:125-7.
4. Akbarsha MA, Pereira S. Mahatma gandhi-doerenkamp center for alternatives to use of animals in life science education. *J Pharmacol Pharmacother* 2010;1:108-10.
5. Wilson MS, Berge E, Maess J, Mahouy G, Natoff I, Nevalainen T, *et al.* FELASA recommendations on the education and training of persons working with laboratory animals: Category A and category C. *Lab Anim* 1995;29:121-31.
6. Carlsson HE, Hagelin J, Höglund AU, Hau J. Undergraduate and postgraduate students' responses to mandatory courses (FELASA category C) in laboratory animal science. *Lab Anim* 2001;35:188-93.

Access this article online

Quick Response Code:



Website:

www.jpharmacol.com

DOI:

10.4103/0976-500X.107689