

## Reporting of method of animal sacrifice in articles published in Indian journals

Sir,

Since long time, a constant demand is made for following of stringent ethical criteria for animal experimental studies. National and international journals publishing the animal studies instruct their authors to report various ethical parameters in manuscripts sent for publication.<sup>[1,2]</sup> In a recent survey done for animal studies done in US and UK, it was observed that various components of the studies are not reported adequately in the published articles.<sup>[3]</sup> On the basis of this survey, a guideline is formulated for reporting

of animal studies. This guideline is called ARRIVE (Animal Research: Reporting *In Vivo* Experiments) guideline.<sup>[4]</sup> This guideline is based on CONSORT (consolidated standards of reporting trials) statement for reporting of clinical trials.<sup>[5]</sup> In the “ethical statement section” it is mentioned that in the manuscript of animal studies, ethical parameters like permission from Institutional ethics committee, license and information regarding various national and international ethical guidelines regarding the use and care of animal should be mentioned. According to this guideline, method of euthanasia should also be mentioned in the manuscript. In an article published in British Journal of Pharmacology it is mentioned that though this guideline is given for *in vivo* animal experiments it may also applicable for the *in vitro* experiments done on isolated tissues of animals.<sup>[6]</sup> In the same, article authors emphasize the importance of detailed reporting of method of euthanasia to see if there is any influence of this on obtained data or not. Various studies highlighted the impact of different euthanasia methods on various experimental outcomes. In a recent study done by Al-Mousawi *et al.*, it was observed that different method of euthanasia in rodent model of severe burn injury influence the levels of various types of inflammatory mediators.<sup>[7]</sup> According to CPCSEA (Committee for the Purpose of Control and Supervision of Experiments on Animals) guideline approved method of euthanasia should be used for sacrificing the animals and choice of euthanasia should depend on type of study and species of animals.<sup>[8]</sup> This guideline also mentions some unacceptable method of euthanasia for any animal or species.<sup>[8]</sup> It is been observed that studies regarding the reporting of ethics in animal studies are very less and there is hardly any data available for the animal studies published in Indian Journals. So this study was designed with the primary aim of appraising animal studies published in two Indian Pharmacology Journals for reporting of whether the information regarding method of sacrifice is mentioned in the manuscripts or not? And if it is mentioned whether the method of sacrifice is acceptable according to CPCSEA or not? Secondary aim of this study was to compare this observation (reporting of method of sacrifice of animal) with some international journal. Indian Journal of Pharmacology (IJP) and Indian Journal of Physiology and Pharmacology are well-known indexed pharmacology journals published in India, chosen for the study. For International comparison British Journal of Pharmacology (BJP) was selected.

All the original animal studies published in IJP, IJPP between 2002 to the latest issue of 2010 were downloaded manually from the website of journals ([www.ijp-online.com](http://www.ijp-online.com), [www.ijpp.com](http://www.ijpp.com)). Original animal studies published in BJP from 2002 to September 2009 were downloaded from journals website (<http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291476-5381>). In the case of BJP, articles published after September 2009 were not available for open access. In

the case of IJPP articles published since 2002 were available on website. Therefore, to maintain uniformity for all the journals, all the articles which were published in or after 2002 were downloaded. Only original animal studies were considered for the study. Short communications, research letters, letter to editors were not taken into account. Out of all the original animal studies downloaded, 50 animal studies were selected randomly (by computer generated random numbers) each from IJP and IJPP and 100 animal studies were randomly selected from the BJP by the first author (JK). For the equal comparison, animal studies only related to pharmacology were downloaded from the IJPP. Each author (JK, PY, NDK) evaluated the animal studies. The method of sacrifice, if mentioned was noted in the predesigned proforma. Discrepancies were solved by consensus.

It was observed that in 57 articles in Indian Journals (IJP, IJPP) it was mentioned that animal was sacrificed. Out of these 57, exact method of sacrifice was mentioned in 35 (61.4%, 95% CI: 48.4%-72.9%) articles. In the case of BJP, in 72 articles it was mentioned that animals were sacrificed. Out of these 72, method of sacrifice was mentioned in 32 (44.4%, 95% CI: 33.5%-55.9%) articles. On the statistical comparison with the help of chi-square test this difference in reporting of exact method of sacrifice between Indian and International Journal was found to be insignificant ( $P = 0.057$ ) [Table 1]. Methods of sacrifice reported in both groups are mentioned in Table 2. On the basis of CPCSEA guidelines, only two methods were found to be ethically unacceptable (stunning, cutting of jugular vein).

On the basis of this study, it can be said that reporting of method of killing of animal is deficient in not only in Indian Pharmacology Journals but also in International Journals. Measures should be taken to improve the reporting of exact method of sacrifice. In the case of isolated tissue experiments, response of tissue is not only influenced by the type of anesthesia (as euthanasia), but also by timing of sacrificing of animal. So, this information must be included in the study.<sup>[6]</sup> Editor should demand from authors regarding information related to method of euthanasia during the initial review of manuscripts. Instruction of authors section of journals publishing animal studies should be revised to incorporate the information regarding method of sacrifice. It is also a duty of peer reviewer to see whether the sufficient information related to ethical parameters including method of sacrifice is mentioned in the article or not? On the basis of this study we support the use of some structured guideline like ARRIVE guideline for reporting of animal studies so that all the components can be reported adequately. We also like to appeal editors of various biomedical journals involved in publishing animal studies to include ARRIVE guideline in the "Instruction to author section."

**Table 1: Reporting of method of sacrifice**

Method of sacrifice	Frequency (IJP, IJPP) $n = 57$	Frequency (BJP) $n = 72$	$P$ value (Chi-square test)
Mentioned	35 (61.4)	32 (44.4)	0.057
Not mentioned	22 (38.5)	40 (55.5)	

Values in parenthesis are percentages

**Table 2: Method of sacrifice and frequency**

Method of sacrifice	Frequency (IJP, IJPP) $n = 35$	Frequency (BJP) $n = 32$
Cervical dislocation	14	6
Decapitation	7	10
Overdose of ether	9	2
Overdose of thiopentone	2	4
Stunning	1	4
Exsanguiazation	1	2
Overdose of halothene	0	2
Asphyxiation by CO <sub>2</sub>	0	2
Cutting of jugular vein	1	0

This study has few limitations. Findings are based on only three pharmacology journals so more journals, not only from pharmacology but also from other specialties publishing animal studies could have been included. Other limitation is only those articles which mentioned the sacrifice of animals were included. We believe there is a underreporting of this statement especially in animal studies related with isolated tissue experiments.

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## REFERENCES

1. Bavdekar S, Gogtay N, Chavan R. Reporting ethical processes: Survey of instructions to authors provided by Indian journals. *Indian J Med Sci* 2009;63:260-2.
2. Jaykaran, Yadav P, Kantharia ND, Chavda N. Survey of "Instruction to authors" of Indian medical journals for reporting of ethics and authorship criteria. *Indian J Med Ethics* 2011; in press.
3. Kilkeny C, Parsons N, Kadoszewski E, Festing MF, Cuthill IC, Fry D, *et al.* Survey of the quality of experimental design, statistical analysis and reporting of research using animals. *PLoS One* 2009;4:e7824.
4. Kilkeny C, Browne WJ, Cuthill IC, Emerson M, Altman DG. Improving bioscience research reporting: The ARRIVE guidelines for reporting animal research. *PLoS Biol* 2010;8:e1000412.
5. Altman DG, Schulz KF, Moher D, Egger M, Davidoff F, Elbourne D, *et al.* The Revised CONSORT statement for reporting randomized trials: explanation and elaboration. *Ann Intern Med* 2001;134:663-94.
6. McGrath J, Drummond G, McLachlan E, Kilkeny C, Wainwright C. Guidelines for reporting experiments involving animals: The ARRIVE guidelines. *Br J Pharmacol* 2010;160:1573-6.

7. Al-Mousawi, Ahmed M, Gabriela A, Ludwik K, Robert, Gabriel A, *et al.* Impact of anesthesia, analgesia, and euthanasia technique on the inflammatory cytokine profile in a rodent model of severe burn injury. *Shock* 2010;34:261-8. Available from: [http://journals.lww.com/shockjournal/pdf/2010/09000/Impact\\_of\\_Anesthesia\\_Analgesia\\_and\\_Euthanasia.8.aspx](http://journals.lww.com/shockjournal/pdf/2010/09000/Impact_of_Anesthesia_Analgesia_and_Euthanasia.8.aspx). [cited in 2010 Dec 1].
8. CPCSEA. CPCSEA guideline for laboratory animal facility. *Indian J Pharmacol* 2003;35:257-74. Available from: [http://www.ijp-online.com/temp/IndianJPharmacol354257-276457\\_074045.pdf](http://www.ijp-online.com/temp/IndianJPharmacol354257-276457_074045.pdf). [cited in 2010 Nov 8].

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<b>Quick Response Code:</b>	<b>Website:</b> <a href="http://www.jpharmacol.com">www.jpharmacol.com</a>
	<b>DOI:</b> 10.4103/0976-500X.81912