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Ethics of involving animals in research

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Abstract

Use of animals in research is a highly debatable topic. Though their use has led to several discoveries and understanding of many aspects of science but their use in certain sectors needs to be justified. There are national and international laws which govern the use of animals in research, all of which are based on the principles of the 4Rs – replacement, reduction and refinement and the rehabilitation of the use of animals in research. It is mandatory that all institutions involved in animal research develop and abide by the ethical review processes which promote good animal welfare practices by ensuring that the use of animals at the designated establishment is justified. With the availability of many alternatives, the lives of many animals can now be secure.

KEY WORDS: Animal, ethics, reduction, refinement, rehabilitation, replacement, research

INTRODUCTION

“The question is not, can they reason? Nor, can they talk, but can they suffer.”

This profound thought provoking statement was made by Jeremy Bentham to oppose the ideology of many scientists in the nineteenth century that animals are incapable of suffering from pain. Animals are used primarily in fundamental biological and medical research, developing new treatments for diseases and new diagnostic tests, safety testing of chemicals and drugs and in biology, and medical education.^[1]

The understanding of present day medicine as well as unraveling of many mysteries of science has been possible owing to the numerous experiments performed on animals. Engaging in research is an integral part of human mind and is immensely related to animal experimentation. However, there has been a lot of debate over the use of animals in research. Though there are national and international laws, which govern the use of animals in research, all of these echo the same universal doctrine of Russell and Burch (1959) to develop initiatives for the widest possible application of the 3 R's-replacement, reduction, and refinement of the use of animals in research. It is therefore mandatory that all institutions involved in animal research develop and abide by the ethical review processes, which promote good animal welfare practices by ensuring that the use of animals at the designated establishment is justified.^[2,3]

There are many national and international bodies, which guide the animal experiments as animal welfare is considered as “experimentation with responsibilities.” The International Committee for Laboratory Animal Science (ICLAS) (currently the office of the President of ICLAS, based in USA, has a membership of about 100 countries and has set up international guidelines for experimental procedures and training of researchers. In India such guidelines have been published by Indian National Science Academy in 1992, which were recently revised in 2000. There are many laws, which have been implemented in the developed countries especially in the UK, Netherlands and USA. Unfortunately, most of these laws do not reflect or mention about rehabilitation. In India, the National centre for laboratory animal science (NCLAS) in Hyderabad and the Central Drug Research Institute in Lucknow and some public and private sectors have good animal laboratory services. Though many facilities exist, but most of them lack adequate maintenance.[3]

In India, the initial foundation of humane and ethical use of animals in research was made by the prevention of cruelty to animals Act of 1960. This act decries any form of injustice to animals and mandates to take all such measures as may be necessary to ensure that animals are not subject to unnecessary pain or suffering before, during or after the performance of experiments on them. This very act paved the way for a Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA). However, it was not until 1999 when CPCSEA became functional. The CPCSEA not only allows the discussion of animal's related issues, but also has the power to lay down laws to protect animal rights such as “Breeding of and Experiments on Animals (Control and Supervision) Rules 1998.” For many years the CPCSEA has been very actively rescuing animals from laboratories. It has also enforced good laboratory practice related to animals, designed guidelines for the use of animals in the laboratories abiding by the principles of 3 R's and most importantly brought forward the concept of the fourth R, “rehabilitation” of used laboratory animals. The CPCSEA has also made it a mandatory national policy that personnel using experimental animals have a moral responsibility toward these animals after their use so much so that costs of after-care/rehabilitation of animals post experimentation are to be a part of research costs. This committee comprises of nominated members and representatives from national regulatory agencies namely, Ministry of Health and Family Welfare, Ministry of Environment and Forests, national academic and research councils, research institutes, eminent scientists, and animal welfare organizations. There are many non-government organizations like the People for ethical treatment of animals (PETA), Society for prevention of cruelty to animals (SPCA), Blue cross, which carry out a lot of activities to ensure animal welfare.[4]

The 4 R's refer to replacement, reduction, refinement and rehabilitation.[3]

Replacement: Refer to methods which avoid or replace the use of animals and these can be absolute by using *in silico* (computer based programs) and *in vitro* methods (human volunteers) or relative replacement (e.g., invertebrates, such as fruit flies and nematode worms).

Reduction: Refers to methods, which allow researchers to obtain comparable levels of information from fewer animals, thereby minimizing animal use (e.g. improved experimental design, modern imaging techniques, sharing data, and resources).

Refinement: Refers to improvements in procedures, which minimize pain, suffering and distress and allow general improvement of animal welfare (e.g., improvement in the living conditions of research animals, anesthesia and analgesia for pain relief).

Rehabilitation: Refers to after-care and/or rehabilitation of animals post-experimentation. All researchers using experimental animals have a moral responsibility to the animals after use. Rehabilitation of experimental animals is a legal requirement in India.

Each institute involved in animal research should have an ethics committee for monitoring research activities on the animals. This can be further strengthened by providing accreditation services to laboratories by constituting, National Accreditation Board of Testing and Calibration Laboratories having membership of the International Laboratory Accreditation Cooperation. All

scientists involved in animal research should be conscientious and concerned about the animal welfare throughout the research.

Laboratory Animal Sciences is an emerging new field, which is specialized and is not covered in the curriculum of the courses where research on animals is performed. There is a definite demand of trained manpower in this sector both at the senior and junior levels. Training and certification in laboratory animal care and procedures of all personnel working with the animals either at the management level or for experimentation or involved in the maintenance of the animal housing facilities should be made mandatory. The training course can be of short duration for research workers who need to orient specifically for the experimental procedures but those who are involved in managing the facilities must have a longer training (6 months to 1 year).

HUMANE SCIENCE-THE SCIENCE OF ALTERNATIVES

It is well-known and projected that animals are rarely good models for the human body due to their different anatomical and physiological properties. Hence, it is not always worthwhile by trying to infect animals with diseases, which they would not normally contract. In many cases, the outcome can be disastrous it can harm and kill humans as well as not prove worthy enough by hurting the animals and waste resources. For example, thalidomide was tested on animals and judged safe, but had devastating consequences for the people who used them.

Animal testing wastes time and resources by misleading researchers. In a testimony Dr. Albert Sabin, who developed the oral polio vaccine, cited that his work had been “delayed by an erroneous conception of the nature of the human disease based on misleading experimental models of the disease in monkeys.” Such erroneous leads generate more studies, which will only multiply the sufferings of animals.

Just as many important discoveries were based on the outcome of animal experiments, almost all important developments in health-care are attributable to human studies e.g. anesthesia; the stethoscope; radium; penicillin; artificial respiration; antiseptics; the computed tomography scan and magnetic resonance imaging and the isolation of the virus, which causes acquired immune deficiency syndrome. Animal testing played no role in these and many other developments.

Many companies and scientists have developed alternatives to the use and abuse of animals. A comprehensive review of the websites, organizations and journals is available.^[5] Though searching for alternatives and applying them for research is indeed a challenge. Many laboratories and pharmaceutical companies have developed computer based software programs, which have replaced the use of laboratory animals. Many software packages are available, which allows researchers to predict chemicals’ oral toxicity as well as their degree of skin and eye irritation. Many progressive universities have changed their syllabi and opted for humane, scientific teaching methods, which have omitted the use of animals for dissection. One such software based alternative is the Compu Series, developed, and marketed by the Chennai-based Blue Cross, which allows students to digitally dissect all laboratory animals. Furthermore, it is well-understood that clinical trials, the use of human volunteers, case studies, autopsy reports and statistical analyses as well as the use of actual environmental factors related to human disease permit far more accurate observation than is possible with animals who are confined to laboratories.

“The history of cancer research has been a history of curing cancer in the mouse. We have cured mice of cancer for decades and it simply didn’t work in humans, we need to acknowledge the fact that use of animals will not make us better scientists, but bitter scientists”.

- Dr. Richard Klausner

Footnotes

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REFERENCES

1. Festing S, Wilkinson R. The ethics of animal research. Talking point on the use of animals in scientific research. *EMBO Rep.* 2007;8:526–30. [PMCID: PMC2002542] [PubMed: 17545991]
2. Robinson V. Finding alternatives: An overview of the 3Rs and the use of animals in research. *Sch Sci Rev.* 2005;87:1–4.
3. Giridharan NV, Kumar V, Muthuswamy V. Use of Animals in Scientific Research. *Indian Counc Med Res.* 2000:1–27.
4. Pereira S, Tettamanti M. Ahimsa and alternatives: The concept of the 4th R. The CPCSEA in India. *ALTEX.* 2005;22:3–6. [PubMed: 15719144]
5. Hakkinen PJ, Green DK. Alternatives to animal testing: Information resources via the Internet and World Wide Web. *Toxicology.* 2002;173:3–11. [PubMed: 11955681]

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