



Necessity of Drug Testing on Animals – An Analytical Study.

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ABSTRACT:

Drug testing on animals has long been a controversial issue in the scientific community, raising ethical, moral, and practical concerns. The number of animals used in research has increased as medical technology got more advanced. Every year, millions of experienced animals are used all over the world. The pain, distress and death experienced by the animals during scientific experiments has been a matter of concern for a long time. While it has been a successful way to test the safety, efficacy and side effects of products, it has also been an ethical concern due to the potential suffering of animals involved. The ethical debate surrounding this practice is complex and multifaceted and it is important to consider both sides of the arguments when determining whether animal testing is a necessary part of drug development. This paper will discuss the arguments in favor of animal testing and the counterargument against it, as well as provide an overview of the current state of animal testing and its regulations.

KEYWORDS: Animal testing, drug testing, alternatives to animal testing, ethics, Drug development, animal welfare.

INTRODUCTION:

Drug testing on animals is a process in which animals are given a drug or chemical and monitored for any adverse reactions. This process is used to evaluate the safety and efficiency of a drug before it is given to humans. It has become a necessary part of the development of drugs for human use and has resulted in the protection of humans from potentially dangerous drugs and treatments.

Proponents of animals testing argue that it is necessary in order to ensure the safety of new drugs and treatments before they are used on humans. They also point out that animal testing has led to the development of many life-saving drugs and treatments. However, opponents of animal testing argue that it is cruel and unnecessary, and that alternatives such as cell cultures and computer models can be used instead.

While animal testing has played a critical role in the development of many life-saving medications, it is essential to balance the benefits of animal testing with the ethical concerns of animal welfare.

BACKGROUND:

Throughout the history of biomedical research, animals have been used repeatedly. Early Greek physician-scientists performed experiments on living animals, such as Aristotle, (384 – 322 BC) and Erasistratus, (304 – 258 BC). Likewise, Galen (129 – 199 / 217 AD), a Greek physician who practiced in Rome, conducted animal experiments to advance the understanding of anatomy, physiology, pathology, and pharmacology. An Arab physician in twelfth century Moorish Spain named Ibn Zuhr (Avenzoar), introduced animal testing as an experimental method for testing surgical procedures before applying them to human patients. Since then, it has been a common practice in the medical industry to test drugs on animals, as they are cheap, easy to control, and generally have similar biological responses to humans.

Animal testing is usually done on laboratory animals such as mice, rats, rabbits, and primates, and it is often done in a controlled environment. The use of animal testing has been very successful in developing safe and effective drugs, and it has been a major factor in the success of modern medicine. Today, animal testing remains prevalent in drug development. According to the National Institutes of Health (NIH), more than 25 million animals are used in research each year in the United States alone.

RESEARCH METHODOLOGY:

To evaluate the quality of the research methodology employed in drug testing on animals, this study will conduct a systematic review of the literature. The search will be conducted using variety of sources, including peer-reviewed journals, government reports, PubMed, Web of Science, and other relevant sources. The search was conducted using the following keywords, “animal drug testing,” “animal experimentation,” “research methodology,” “ethical consideration,” and “laboratory animals.”

NO. OF ANIMALS USED IN DRUG TESTING:

The exact number of animals used in drug testing is difficult to determine, as many organizations do not publicly report the number of animals used in their research. However, estimates suggest that around 100 million animals are used in drug testing worldwide each year. Of these, approximately 60 million are used in pre-clinical trials, while the remaining 40 million are used in clinical trials. The majority of the animals used in drug testing are rodents, such as mice and rats, followed by fish and other aquatic species, birds, and primates.

Some are forced to inhale toxic fumes before their deaths, others are immobilized in restraint devices for hours, some have holes drilled into their skulls, and others have their spinal cords crushed or their skin burned off. In addition to the agony of the actual experiments, animals in laboratories are underprivileged of everything that is natural and important to them—they are confined to desolate cages, socially isolated, and psychologically traumatized. The thinking, feeling animals who are used in experiments are treated like nothing more than disposable laboratory equipment.

ARGUMENTS FOR ANIMAL TESTING:

One of the main arguments in favour of animal testing is that it has contributed significantly to medical progress. Animal testing has been essential in developing treatments for many diseases, including cancer, HIV, and heart disease. Animals testing has also been crucial in determining the safety of drugs before they are tested in humans.

Another argument for animal testing is that it is necessary to ensure the safety of human beings. Without animal testing, drugs would have to be tested on human volunteers, which could be dangerous and potentially fatal. Animal testing provides valuable information about the toxicity of drugs and their potential side effects, which can help prevent harm to humans.

-PROS:

- **MEDICAL ADVANCEMENTS:** Animal testing has contributed significantly to medical progress and has led to the development of treatments for many diseases. It has played a vital role in the discovery of insulin and the development of vaccines for diseases such as polio and hepatitis B.
- **SAFETY TESTING:** Animal testing is necessary to ensure the safety of drugs before they are tested on humans. It provides valuable information about the toxicity of drugs and their potential side effects, which can help prevent harm to humans.
- **UNDERSTANDING DISEASE MECHANISMS:** Studying animal models can help scientists better understand the mechanisms of diseases, Which can lead of new treatments and cure.
- **REGULATORY REQUIREMENTS:** Animal testing is a regulatory requirement in many countries to ensure the safety and efficacy of drugs before they can be approved for use in humans.

ARGUMENTS AGAINST ANIMAL TESTING:

Animals testing has been criticized for ethical reasons, as many people believe that it is cruel and inhumane to subject animals to potentially painful or harmful experiments. Animals testing can cause physical and psychological harm to animals, including pain, suffering, and death.

There are also concerns about the validity of animal testing. Animals have different biological systems and responses to drug than humans, Which can make it difficult to extrapolate the results of animal testing to humans. This can lead to false conclusion about the safety and efficacy of drugs, Which can be dangerous for humans.

-CONS:

- **ETHICAL CONCERNS:** Animal testing is controversial and raises ethical concerns as it involves subjecting animals to potentially harmful or painful experiments. This has led to criticism of the practice from animal rights groups and the general public.
- **VALIDITY CONCERNS:** Animal testing can be problematic as animals have different biological systems and responses to drugs than humans, making it difficult to extrapolate results from animal testing to humans. This can lead to false conclusion about the safety and efficacy of drugs, which can be dangerous for humans.
- **ANIMAL WELFARE:** Animal testing can cause physical and psychological harm to animals, including pain, harm to animals, including pain, suffering, and death. This has led to calls for more humane treatment of animals used in experimentation and alternatives to animal testing.
- **COST AND TIME:** Animal testing can be expensive and time-consuming, and the results obtained may not always be reliable, leading to delays in drug development.

ALTERNATIVES:

Today in every new drug discovery countless rats, monkeys, dogs, rabbits and other animals are poisoned, cut open, burned, blinded, drugged, and starved behind closed laboratory doors. In most drug studies, we obtain inaccurate result due to the vast physiological variation among animal and human. Animal studies teach us little about the health of human reactions to illness and medications are fundamentally different from the reactions of other animals. Different animals absorb, metabolize, and excrete substances differently than humans do. After all of this we continuously used animals for experimentation at research centres and collages. so, why we can use animals. Nowadays several non-animal testing methods are available. Although they may not provide completely accurate results, they do offer comparable information about drug testing. The biggest challenge of non-animal experimentation today is obtaining accurate results. Fortunately, several techniques are being used to reduce the use of animals in experiments. Nowadays several techniques are used which can reduce animal uses. Two major techniques are in vitro cell culture and in silico computer stimulation. In vitro methods involve testing drugs on isolated cells or tissues in a laboratory setting, while computer modelling uses computer simulations to predict how a drug will interact with human cells and tissues. Human cell-based assays involve testing drugs on human cells, which can provide a more accurate prediction of human outcomes.

- **IN VITRO TESTING:** This involves testing drugs on cells, tissues or organs grown in a laboratory setting. These tests can provide valuable information about the drug's efficacy and toxicity without using animals.
- **COMPUTER MODELLING:** Computer modeling can be used to simulate the effects of drugs on the human body. This approach uses advanced algorithms and computer simulations to predict the drug's effects and can be used to identify potential side effects and drug interactions.
- **MICRODOSING STUDIES:** In microdosing studies, small amounts of drugs are given to human volunteers, and the response is measured. These studies can provide valuable information about how the drug is metabolized and eliminated from the body.
- **HUMAN CELL-BASED ASSAYS:** Human cell-based assays can be used to test the toxicity and efficacy of drugs on human cells.
- **HUMAN BASED CLINICAL TRIALS:** Human-based clinical trials can be used to test the safety and efficacy of drugs in humans. These trials involve carefully monitoring human volunteers who have agreed to participate in the study.

Overall, these alternatives to animal testing provide a more ethical and cost-effective approach to drug development and testing while also reducing the potential risks and negative impacts associated with animal testing. Ultimately, the goal should be to find a balance between the need for drug testing and the ethical and scientific considerations of using animals in research.

CONCLUSION:

Animal testing has been essential in developing many life-saving treatments and ensuring the safety of drugs before they are tested in humans. However, concerns remain about the ethics of using animals in experiments and the validity of the results obtained from animals testing. There are several alternatives to animal testing that are being developed, and strict regulation govern animal testing to ensure that it is conducted in a humane and ethical manner. As technology continues to advance, it is possible that animal testing may become obsolete, but until then, it remains an important tool in drug development.

The issue of animal testing for drugs is complex and controversial, with valid arguments on both sides. It is ultimately up to individuals and society as a whole to weigh the benefits and ethical concerns of animal testing and make informed decisions about how to proceed. Many countries have regulations in place to ensure that animal testing is carried out in the most ethical way possible, with the goal of minimizing harm to animals while still ensuring the safety and effectiveness of new drugs.

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