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Ethical Issue of the Use of Animals in Biomedical Research

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Abstract

The abolition of the use of animals in biomedical research is increasingly at the heart of debates. Animal experimentation has thus gradually evolved to establish strict and precise regulatory and ethical guidelines throughout the world. In this presentation, we propose an alternative that is more respectful of these ethical and regulatory principles based on a translational study focusing on sentinel lymph node invasion in breast cancer.

Keywords: Ethics; Animal research; *In vivo* imaging; Biomedical research

Mini Review

The use of animal experimentation in biomedical research has evolved rapidly in recent years. The sensitivity of public opinion towards animals and particularly when it comes to experimental uses has increased considerably with animal rights organizations. The European community has established regulations to define the areas of legality for experiments and to set the conditions. We are thus witnessing a reduction in the number of animals used in the development of methods and the establishment of ethics committees being created in research establishments. In developing countries, a certain number of countries have some rules based on Western reference texts concerning the use of animals in experiments or ethical committees that are almost non-existent. But where they exist, these rules generally remain quite lax when it comes to experimentation on non-human animals. All this shows that animals used in biomedical research will continue to benefit from almost zero protection as long as the laws accept that their lives and well-being have little value. The application of the ethical principles thus developed is difficult to integrate into African culture and despite the benefits of medical research, an impression of exploitation persists for African populations. Thus, to enable African researchers to reduce the use of animals in experiments, we propose an alternative method in translational research in oncology [1-4].

Proposal of the Ethical Approach

The ethical approach that we propose corresponds to: - On the one hand the concept abbreviated as "3 Rs": Reduce to use the strict minimum of animals necessary, Refine, i.e. only carry out animal experiments when it cannot be done otherwise, and replace whenever it's possible. - On the other hand, in vivo imaging which is a non-invasive approach making it possible to obtain as much anatomical and functional information as necessary. This is an internationally recognized strategy for pharmaceutical innovation and development without having to sacrifice animals at different time intervals. It makes it possible to measure parameters inaccessible by conventional methods. The associated experimental approach consisted of performing tumor grafts in mice and studying the micro invasion of the lymph node located in the lymphatic drainage area [5,6].

Application of the Ethical Approach

We examined the application of the proposed approach in experimental oncology on mice in a translational research strategy. The imaging techniques that were implemented during this thesis work are non-invasive techniques, tumor growth as well as the associated parameters could be monitored several times and longitudinally in the same animal, which is its own control,

thus increasing the precision of the experiment. This procedure thus accelerates the obtaining of results, by reducing the number of animals required in the cohort. Furthermore, the size of the tumor, weight loss and reduced mobility were also subject to strict monitoring. During the various studies carried out, appropriate anesthetics and analgesic regimens for pain relief were used.

Conclusion

The development of biomedical imaging research on small animals has opened new perspectives for the study of biological processes in living animals. In vivo imaging is a non-invasive approach that allows obtaining as much anatomical and functional information as necessary. Imaging is therefore a more ethical method in animal experimentation and fits perfectly with the 3R rule to be promoted in our research laboratories in Africa.

Summary

Introduction: The abolition of the use of animals in biomedical research is increasingly at the heart of debates. Animal experimentation has thus gradually evolved to establish strict and precise regulatory and ethical guidelines throughout the world. In this presentation, we propose an alternative that is more respectful of these ethical and regulatory principles based on a translational study focusing on sentinel lymph node invasion in breast cancer**.**

Methodology: The ethical approach used corresponds on the one hand to the concept abbreviated to "3 R's": Reduce to use the strict minimum of animals necessary, Refine, that is to say only carry out animal experiments when necessary. cannot be done otherwise, and Replace whenever possible and on the other hand to in vivo imaging which is a non-invasive approach allowing to obtain as much anatomical and functional information as necessary.

Results: This is an internationally recognized strategy for pharmaceutical innovation and development without having to sacrifice animals at different time intervals. It makes it possible to measure parameters inaccessible by conventional methods. The associated experimental approach consisted of performing tumor grafts in mice and studying the micro invasion of the lymph node located in the lymphatic drainage territory.

Conclusion: The development of imaging research biomedical research on small animals has opened new perspectives for the study of biological processes in living animals. Imaging is therefore a more ethical method in animal experimentation and fits perfectly with the 3R rule to be promoted in our research laboratories in Africa.

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