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Special article

Storage of human samples for research: Autonomy and genomic data☆

Almacenamiento de muestras humanas aptas para investigación: autonomía y datos genéticos

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Introduction

The collection of human biological material and associated data, storage practices and use of samples are considered key processes in biomedical research due to the opportunities that they offer as a source of information, particularly in genetic research. However, the extraction and use of biological samples also entails potential conflicts or ethical issues that concern the people from whom they originate, the healthcare professionals who handle them, the researchers, and society in general.

The main moral concerns posed by the use of biological samples for research relate to obtaining consent, protecting confidentiality and the way in which results or incidental findings that are of interest to the participant or their family members are handled.[1]

The values to promote in human research could be summed up as showing respect for the participant's dignity and autonomy (principle of autonomy) and seeking health benefits for society, together with the moral obligation to maximise the potential benefits and minimise potential damage (beneficence and non-maleficence), as well as distributing fairly the risks and costs, on the one hand, and benefits on the other hand (justice). Likewise, we must not forget the legal principle in a regulated activity such as clinical research.

All this has led to the development of a number of important guidelines and regulations related to obtaining, storing and using human biological samples. In Spain, following the law on Biomedical Research (14/2007 dated 3 July; *Ley 14/2007 de 3 de julio, de Investigación Biomédica* [LIB]),[2] and the Royal Decree (RD) on biobanks[3] (1716/2011 dated 18 November), a regulatory framework on this matter was developed in compliance with guidelines from the Council of Europe.[4] In the present study, we seek to address through the analysis of a single case some of the situations that both researchers and Research Ethics Committees (RECs) more frequently face from the ethical and legal points of view.

Objectives

The objectives for the analysis of this clinical case are to set forth the issues that researchers and RECs more frequently face when addressing studies that involve genetic analyses and to propose some solutions to facilitate the decision-making process.

Case presentation

In this article we will tackle the ethical assessment of a research proposal in which biological samples from minors will be used. The analysis will focus on the description of facts and values in conflict, the investigation of possible courses of action, and the identification of the optimal way forward[5] in relation to 3 specific aspects: the collection and use of samples, research on minors, and the handling of genetic data.

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Relevant facts

The researcher wishes to use samples collected from previous projects in a new research study. These are stored in a registered collection, along with samples donated by other colleagues. It is unknown whether the samples were obtained with consent for their storage and use in research, or if they are coded (reversibly dissociated), or anonymous. Additionally, the researcher contemplates collecting new samples and, to this effect, she is going to request the parents' consent to use the remainder of the biological samples obtained for diagnosis for research purposes. The researcher informed the parents that genetic analysis would be performed, the results of which could be of interest to other family members. The disease under investigation emerges in very young children whose survival can range from months to a few years.

Values in conflict

In the use of biological samples obtained for diagnostic purposes or from previous research projects, when there is no consent for future use, the conflict lies between the need to respect the autonomy and intimacy of the participants and the need to obtain scientifically valid results.

If, additionally, samples are taken from minors, then the people involved in the research project must especially take into account the need to justify the importance of the knowledge and the way the samples have been obtained.

Genetic analyses particularly affect the right to information, in as much as people have the right to know or not to know, as well as the right to autonomy and confidentiality. The parents' right not to know (autonomy) could be maleficent to third parties if the information obtained from the analysis were to be the source of useful genetic advice for family planning.

Legal aspects

The REC must verify not only the ethical aspects but also the legal aspects and, in its deliberations, it must make sure that its resolutions comply with the regulations in force, which in this sense could be considered as "minimal ethics."

Spain's LIB establishes that to take biological samples and perform genetic analyses, the participant must be informed and their express written consent must be obtained. If the participant is a minor, then it is mandatory to inform them about the terms of use of the samples so that they can exercise their rights in due course.

Likewise, research using biological samples and data is subject to protection under Spain's Organic Law 15/1999 on the Protection of Personal Data (*Ley Orgánica 15/1999, de Protección de Datos de Carácter Personal*),[6] and RD 1720/2007, which regulates its implementation.[7]

However, to ensure that the circulation of samples is limited to a context that preserves the protection of due guarantees, RD 1716/2011 states that the donation of samples should be conducted under a certified contract or agreement between the parties.

Likewise, it is envisaged that the conditions under which biological samples are collected from minors for biomedical research purposes should be subject to additional guarantees, such as the vital importance of obtaining relevant knowledge about the disease in order to understand it, mitigate it or cure it. And, that the aforementioned knowledge cannot be obtained by other means (within the adult population), and that the minor's guardians give their consent. The natural guardians of a minor are the minor's parents. This constitutes part of their parental authority, which is the set of rights and duties that the law grants them with respect to their children.[8] It should be remembered that when the research does not involve invasive procedures (additional to those required for diagnosis), it is not necessary to notify the Public Prosecutor.

Regarding the collection and use of samples in this case, certain facts need to be taken into consideration since they pose several ethical issues.

Is it right to undertake research using samples—initially obtained for diagnostic purposes—without the participant's consent to use them for research?

Respecting people's autonomy and privacy compels us to obtain and use samples for research purposes that are to be stored anonymously or coded in collections or biobanks after having obtained previous written consent from the participant, once they have received the relevant information. As in other countries, Spanish regulations establish the minimum information that the participant should receive in the process of obtaining consent (Table 1).

This issue, affecting the autonomy (lack of consent for research purposes) and maleficence principles (risk of the misuse of information and breach of confidentiality) is resolved in the LIB and RD on biobanks which define it as an exceptional situation when pursuing a potential common benefit (benefits arising from the research).

In the case we are dealing with, samples from groups A and B (Table 2) could come from diagnostic remains or from previous projects, which researchers had kept. In group A (samples collected prior to LIB), the REC must verify whether overall consent to conduct research was obtained, which would be common with samples from previous projects and rare with samples left over following diagnostic tests. In the absence of consent for research, the REC could demand proof that a reasonable effort had been made to obtain it, although it could consider classifying the situation as of an exceptional nature, permitted under the LIB as a second transitory provision. In group B, the REC should ask for the signed consent and verify whether storage and subsequent use for research in the study was authorised. In the absence of signed consent, it must be applied for. If this is not possible, or if it represents a clearly unreasonable

Table 1
Minimum information to obtain informed consent in this case.

Description of the research project or lines of research for which consent is given
Identity of the person in charge of the research
Instruction that the donated sample is to be used only within the scope of a: project, collection, biobank
Instruction that the participant will have at their disposal all the information relating to the research projects in which the sample will be used
Expected benefits arising from the research project or the biobank
Potential issues associated with the donation and the collection of the sample
Location where the analysis will take place and ultimate destination of the sample
Guarantees for the protection of confidentiality
ARCO rights: right to data access, consent rectification, cancellation and objection, full or partial
Possibility of including some restriction on the use of samples
Waiver of any right of an economic nature. Nevertheless, there could be financial compensation for the trouble and other inconveniences that may derive from participation in the study
That, in the case of a prospective biobank closure, the information about the destination of the samples will be at their disposal in the National Registry of Biobanks