A "special dose" of ethics in forensic toxicology

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ABSTRACT

Forensic toxicology is the branch of toxicology that applies the principles and knowledge of the latter to issues and problems related to the field of law enforcement officers, lawyers, judges, and juries. There is a need to establish specific codes, currently lacking, for forensic toxicologists, to guide them in situations where ethical issues are linked to the job the toxicologists carry out. To fill this gap, two international scientific societies: The International Association of Forensic Toxicologists (TIAFT) and the Society of Forensic Toxicologists (SOFT) decreed the same Code of Ethics indicating personal and professional behaviours to be followed by societies' members. The code details what it is intended for: professionalism, competency, proficiency, and clear communication of forensic toxicologists, trying to answer the ethical dilemmas, not yet encoded in official norms. Concerning toxicological and forensic analyses, necessary to support medical evidences, the knowledge of laboratory data uncertainty is mandatory to ensure the reliability of analytical results to be used in medico-legal contexts. Gathered together, all the discussed recommendations constitute the authors' vision of "special dose" of ethics in forensic toxicology

Keywords: *ethics, forensic toxicology, ethical code*

BACKGROUND

Forensic toxicology is the branch of toxicology that applies the principles and knowledge of the latter to issues and problems in the field of law. To achieve this, analytical chemistry techniques are combined with principles of toxicology to address issues related to the toxic effects of substances on humans in the judicial and administrative settings (1).

The key responsibility of forensic toxicologists remains to assist the judicial system in deciding whether a given substance may have a clinical or toxicological impact on the outcome of a legal dispute. To this end, the forensic toxicologist has to establish firstly the presence and exact identity of the suspected chemical (prescription, illicit drug, or poison) in an individual. Secondly, she/he has to determine a relationship between exposure to that xenobiotic (foreigner and life: a substance of any kind, of natural or synthetic origin, foreign to an organism) and the occurrence of a harmful effect or even death.

As recently reported (2), due to the current absence of any regulatory organization, forensic toxicology has no official recognition, that should provide specific rights and responsibilities to forensic scientists. For this reason, there is a need for specific guidelines to drive forensic toxicologists in situations where ethical issues can arise.

There are some ethical dilemmas that have not be yet properly addressed by written rules:

- professional *versus* personal ethics,
- professional credentials,

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- potential conflict of interest,
- confidentiality of information,
- updated knowledge in the field,

and finally, but most importantly, the use of proper analytical procedures to generate data, that have to be correctly interpreted with witness presentation in a judicial court (2-4).

In any organized entity (i.e., civilization, city, family, profession) there are certain behaviours or norms that are considered acceptable by the group and other behaviours which are not. In professional organizations, codes of conduct are developed and, as a consequence, to stray very far from the established norms by the group would risk being ostracized by colleagues. In a profession, the codes of conduct may be unspoken, spoken, and/or written (5).

At that point, is the source of the code of ethical behaviour important? In this regard, it would seem more than normal to firmly answer yes, and therefore in the lack of official mandatory rules, two international organizations of forensic toxicologists, The International Association of Forensic Toxicologists (TIAFT) and the Society of Forensic Toxicologists (SOFT) enacted quite identical Code of Ethics, requiring members of the societies to accept the code as a prerequisite to retain membership (6,7).

Specifically, both in case of TIAFT and SOFT, members should agree to:

- perform professional activities with honesty, integrity and objectivity,
- refrain from knowingly misrepresenting professional qualifications including, but not limited to: education, training, experience, certification, area of expertise, and professional memberships,
- hold in confidence and refrain from misusing information obtained or received in the course of professional activities,
- provide expert advice and opinions within the limits of individual competence and generally accepted scientific principles,
- render testimony in a truthful manner without bias or misrepresentation,
- refrain from exercising professional or personal conduct adverse to the best interests and objectives of the two Societies.

In this concern, it is important to highlight that if the two most important associations of forensic toxicologists have adopted exactly the same code, its provisions should represent minimum requirements of each professional approaching forensic toxicology.

In addition, the two codes detail what it is intended for: professionalism, competency and proficiency and clear communication of forensic toxicologists, trying to answer the ethical dilemmas, not yet encoded in official norms.

DISCUSSION

The overview of the above reported “Code of Ethics” highlights how much forensic toxicology requires a high degree of professionalism and ethics (7).

Forensic toxicologists, should always:

- be independent, impartial, detached, and objective, approaching all examinations with due diligence and an open mind;
- conduct full and fair examinations. Conclusions are based on the evidence and reference material relevant to the evidence, not on extraneous information, political pressure, or other outside influences,
- be aware of their limitations and only render conclusions that are within their area of expertise and about matters which they have given formal consideration,
- honestly communicate with all parties (the investigator, prosecutor, defence, and other expert witnesses) about all information relating to their analyses, when communications are permitted by law and agency practice,
- report to the appropriate legal or administrative authorities unethical, illegal, scientifically questionable conduct or impaired competence,
- take appropriate action if there is potential for, or there has been, a miscarriage of justice due to circumstances that have come to light, incompetent practice or malpractice,
- report conflicts between their ethical/professional responsibilities and applicable agency policy, law, regulation, or other legal authority, and attempt to resolve them,
- do not accept or participate in any case on a contingency fee basis or in which they have any other personal or financial conflict of interest or an appearance of such a conflict.

Finally, from the perspective of laboratory staff in the field of forensic toxicology, daily engaged in the development, optimization and application of analytical methods, conducted experiments should help to distinguish between “right and wrong”, “positive or negative”, “above or below a threshold”. However, although analytical toxicologists seek for certainty, there is ambiguity with multiple shades of grey and uncertainty (5), that even an established cut-off will never be able to overcome.

In forensic toxicology, which is a complex discipline where individuals’ life is often at stake, uncertainty can be quantified, taking the form of a dispersion value such as a standard deviation, a margin of error, or a confidence interval associated with a probability and comprising the actual measured value. Unfortunately, measurements intrinsically possess uncertainty, either due to the operator, the instrumentation, the analytical method or the specimen integrity. Analytical bias can be evaluated and corrected to a certain extent through the proper validation of analytical methods and effective quality control procedures in routine practice. However, random error cannot be completely addressed and a specimen tested several times with the same method will produce slightly different results after each analysis. In this context, the calculation of uncertainty ensures the reliability of analytical tests and allows the toxicologist to interpret results more precisely (8). In forensic toxicology, an analytical result (presence or absence of a certain analyte or a value above or below an established cut–off) can have administrative, civil or criminal consequences. Therefore, the expression of uncertainty is crucial for a

correct application of law provisions.

In conclusion, all the above reported concepts briefly discussed represent our view of a “special dose” of ethics in forensic toxicology.

Conflict of interest

None

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