The problems of a medical expert’s testimony reliability assessment in medical malpractice cases

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Abstract: A medical expert’s testimony reliability assessment is accomplished within different gnoseological models. Medical practice can accentuate the intuitive synthetic orientation of an expert’s reflexion. The insufficiency of analytical component can reduce the reliability of an expert’s testimony. The expert conclusions based on the concept of possibility should be replaced by the inferences containing the quantitative characteristics of probability of the analyzed matter. The introduction of quantitative methods to the expert analysis allows to overcome the negative tendencies related to the reliability of the probabilistic conclusions in a medical expert’s testimony.

Key Words: medical malpractice, expert testimony, reliability assessment, probabilistic conclusion, judgment about the possibility, adverse outcome of the treatment

A medical expert’s testimony reliability assessment is one of the most complex tasks of the lawyer in criminal or civil cases dealing with health damage or the death of the patient due to medical malpractice. The complexity of the reliability assessment consists in the fact that:
- firstly, it is being accomplished within different gnoseological models of the parties of the court process;
- secondly, different forms of knowledge are being used in the process of proving a fact: common, professional, scientific and legal ones.

Just in the reliability assessment of the expert’s conclusions, the role of the medical specialist has a special importance. The lawyer usually encounters considerable difficulties and is often unable to assess properly the scientific validity, verifiability of the expert’s conclusions, correctness of the selection and application of the methods of examination, or the general acceptance of these methods within the relevant scientific community. Such assessment requires the competence of the lawyer in the same field of knowledge as the expert.

Cognitive Aspects of Reliability Assessment of a Medical Expert’s Testimony

The reliability of the information is the level of knowledge about the circumstances of the case that is characterized by certainty, i.e. what makes it possible to draw the only correct conclusion in the case. The concept of evidence reliability is not equivalent to the concept of evidence verity. The verity characterizes the information from the perspective of correspondence to objective reality by the content, whereas the reliability characterizes it from the perspective of correspondence to objective reality by the form, i.e. from the position of sureness or justness. The information becomes reliable for the individual when he becomes sure, confident of its verity.

The evidence is assessed as reliable if the statement on the final ascertainment of its verity is completely justified and does not require further substantiation, therefore if there is subjective certainty, conviction in the verity

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of this evidence is present. On the contrary, the evidence is unreliable (probable) if it is not complete when only some justification of its verity is present that requires further proof. That evidence provides some certainty; nevertheless, a subjective assumption of the possibility that this certainty will not be confirmed during the further validation procedure remains.

It is known in cognitive psychology that the conception (approach) of the problem’s consideration and solution by a person in any area of human activity is determined by four groups of factors:
- underlying assumptions determined by the characteristics of the person considering the problem (knowledge, experience, qualifications);
- assumptions concluded by the person from the available data (court records, legislative acts, scientific data, medical records, examination results and so on);
- versions of the person about the key elements of the problem;
- cognitive style of the person considering the problem [1, 2].

The term “cognitive style” refers to an individual’s preferred way of thinking, organising and representing information within the mind [3]. There are several cognitive styles that are known: logical, analytical, and intuitive synthetic [4, 5]. Individuals with different types of these styles have different approaches to problem consideration and to the evaluation of the available information. A rigid cognitive style may lead to a unilateral and incomplete examination of the object.

Work in the field of medicine generally increases the intuitive synthetic orientation of medical experts. However, intuitive judgments always contain, to a varying degree, elements of subjectivity from which the challenge of the reliability assessment of an expert opinion arises. The essence of an expert opinion requires an accurate definition of the boundaries between a personal subjective view and an internal conviction based on a sufficient amount of reliable information.

The only way to meet this requirement is to follow the explicit principle: the structure of an expert report should include an obligatory part “Expert Analysis”. The analytical examination of the factual data should always precede the inductive arguments in an expert opinion. Persuasive evidence in favour of this proposal can be found in the United States Supreme Court’s statement in Joiner:
- Nothing … requires a district court to admit opinion evidence which is connected to the existing data only by the ipse dixit of the expert. A court may conclude that there is simply too great an analytical gap (the author’s emphasis) between the data and the opinion proffered [6].

Methodological Aspects of Reliability Assessment of a Medical Expert’s Testimony

From the methodological point of view, an expert examination is comparable in some ways with scientific research. Scientific (research) activities are focused on obtaining and further the usage of new knowledge. Applied research as one of the types of scientific activities is focused primarily on the application of new knowledge in achieving practical goals and solving specific tasks. An expert examination can be considered from the content point of view as one form of applied scientific research, as a form of the scientific investigation of medical facts.

Scientific investigation as a way of cognition is characterized by consistency, systematicness and methodology. Hence, these listed features of scientific investigation should be applicable to an expert analysis.

To understand the mechanism of reliability acquisition by the expert opinion as evidence, it is important to emphasise the need for substantiation (proving) of the underlying data set out in the expert’s report. In this context, the analysis of the quality of the sources and the procedures of obtaining the underlying data about the object of investigation becomes particularly important. This analysis has certain peculiarities, videlicet within the reliability assessment it is necessary to evaluate the expert investigation not from the judicial, procedural point of view (as in the assessment of the admissibility of an expert opinion), but from the applied scientific one. The algorithm of expert opinion reliability assessment includes the following sequence of steps:

1) assessment of the expert’s person in terms of his competence and capability in a particular field of medicine,
2) assessment of the character of the medical records and other sources of underlying data and the circumstances of its acquisition,
3) content analysis of the information in the expert report (consistency and completeness of explanation, presence of contradictions, inaccuracies, analytical gaps, scientific validity of the conclusions and so on),
4) comparison of the information in the expert report with the information from other procedural sources.

The logic of the consideration of the expert opinion reliability problem requires the analysis of such binary categories as “verity – mendacity”, “reliability – probability”, “possibility – reality”, “conditionality – categoricity”. These categories are in complex reciprocal relationships. For example, veracious data may be both reliable (proven)
and probabilistic (not proven), mendacious data may be both probabilistic and proven ("credible" error).

The issue of the correlation between reliable and probabilistic expert conclusions has great importance in expert opinion reliability assessment. It is generally accepted that probabilistic expert conclusion cannot be regarded as the basis for a judicial decision. However, in practice, probabilistic expert conclusions are quite common. As one of the contributing factors, heterogeneous interpretation of the meaning of such concepts as "reliability", "probability", "possibility" by various authors may be considered. It should be pointed out that the reliability of expert conclusions has a substantial, not formal, nature.

For formal reliability, the existence of a set of provisions determined beforehand which does not require its veracity be demonstrated is characteristic. In the process of the formulation of an expert opinion, it is difficult (if ever possible) to specify empirical evidence (the major premise of a syllogism) as an axiom, from which the conclusion over the minor premise of syllogism would be automatically deduced. Four reliable (unambiguous) conclusions can be deduced from such a correlation of facts, where each case of the presence of one fact corresponds to the presence of another certain fact:

- if the first fact is present, then the second fact is present too,
- if the second fact is present, then the first fact is present too,
- if the first fact is not present, then the second fact is not present too,
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The following formal conclusion may be discussed as an example of an equivalent positive unambiguous act of evidence:

a) the general provision (the major premise): “If and only if a significant increase in the level of D-dimers is present, then acute trombophlebitis is present”,

b) the evidence (the minor premise): “A significant increase in the level of D-dimers is present in the patient’s blood”,

c) the conclusion: “The patient has an acute trombophlebitis”.

Nevertheless, it is known that a significant increase in level of D-dimers may be present also in myocardial infarction, malignant tumours, liver diseases, active inflammatory processes etc. The reliability of the diagnosis depends on other specific conditions. Therefore, in this example, the construction of the expert’s conclusion should have the form of a conditional judgment.

Substantial reliability can only be achieved by:

a) the application of many times proven-in-practice methods of observation;

b) an appropriate, consistent and systematic medical data analysis in a methodologically unified way,

c) a comparison of the intermediate and final conclusions with the provisions of modern science and evidence-based medical practice.

Only under these conditions will the expert’s subjective conviction in the reliability of his conclusions be fully justified.

One of the main problems of expert analysis in medicine is the problem of analytical criteria, of their content and precision. The uncertainty of the expert criteria of health care quality assessment due to the complexity of medical processes and limited validity of clinical knowledge about the appropriate responses to this complexity is one of the main factors that reduces the reliability and the objectivity of a medical expert’s testimony [7, 8].

For the purposes of expert opinion reliability assessment, the content of each criterion of the expert analysis, namely concerning the unification of these criteria, should be accurately determined at the conceptual level. A unified definition of the subject differs from the notion by the certainty of the content, by its much more thorough and objective reflexion of reality [9, 10]. Currently, the unified criteria of expert analysis should be used to assess the adequacy of diagnostics and treatment in each examined clinical case with an account of the data from modern medical evidence-based studies. It should be noted that the tasks associated with the creation of unified criteria and methods of expert analysis, determination of its sequence (stages), have not yet been satisfactorily resolved.

Expert conclusions as scientifically substantiated responses to the questions posed within the competence of the expert are formulated on the basis of:

1) objective data acquired in the process of expertise,

2) an expert analysis of the case materials, the provisions of medical science, data of evidence-based medical studies, and

3) the subjective internal conviction of expert.

Subjective factors like internal conviction have an important role in the substantiation of expert conclusions. If a high degree of probability develops in the reliability according to the expert’s internal conviction, then the
expert conclusion assumes a categorical form, which is intended to express the expert’s conviction and serves as a reliability guarantee for the court.

Therefore, the internal conviction of the expert is one of the common foundations for the formulation of reliable conclusions. In this connection, if the scope of medical science or the characteristics of the object examined prevent the expert from a categorical conclusion, the expert in this capacity should either conclude in a probabilistic form or refuse to respond to the question.

**Conclusion. Probability and Possibility in a Medical Expert’s Testimony**

In the assessment of the reliability of a medical expert’s testimony, it is worth drawing attention to the ratio between the concepts of probability and possibility. There are certain boundaries between a probabilistic judgment and a judgment about the possibility. A probabilistic judgment is the opposite of a reliable one and they differ by the nature of the knowledge expressed. A judgment about the possibility is individualized by the nature of the relationships between the properties and the subject. Judgments about the possibility have a greater importance in court and expert practice. Along with it, it is quite difficult to discuss the concepts of probability and possibility in different planes, because probability is a measure of the possibility of a random event.

From the positions of proper scientific substantiation, the formulation of expert conclusions using the concept of “possibility” has to be replaced by the quantitative characteristics of the random event’s probability. When a high degree of probability of certain event is present, then such event should be considered as practically reliable in accordance with the principle of “ignoring quite small probabilities”. An objective assessment of the character of the relations between the medical personnel’s activities and the outcome of a disease requires the development of methods of risk degree measurement of separate medical interventions, of quantitative evaluation of the impact of the objective and subjective conditions on the outcome of the treatment. From the perspective of probabilistic determination, the pathologic process in the patient’s body is the process of dynamic threats to health either progressing to the adverse outcome realization under a certain set of conditions or regressing to recovery under another set of conditions. The rendering of adequate health care is one of these conditions.

It is quite characteristic that presently lawyers more and more often demand merely a quantitative, statistical evaluation of individual events in medicine, including the probabilistic assessment of adverse outcome of disease in cases of the application of different medical approaches. Statistical research and the registration of numerical information on adverse outcomes in medical practice are actively maintained in modern, evidence-based medicine. On the basis of statistical medical data, the schemes and models of causal relations’ assessment, prognosis, effectiveness comparison of the various methods of diagnostics and treatment, ascertainment of the links between the medical staff’s activities and the clinical results are being created.

The reason for this interest in the quantitative, probabilistic assessment of the course of a disease, of the effectiveness and risks of individual medical interventions, of the relations between different objective and subjective factors and the adverse outcome of the treatment is contained in the extreme scarcity of dynamic laws and the predomination of statistical ones in complex open systems, in the deterministic-probabilistic nature of these systems. The relations between the phenomena, which examines the medical doctor in the diagnostics and treatment of the patient, have a complicated, diverse and variative character.

Thereby, in an assessment of a medical expert’s testimony reliability, the lawyer inevitably meets with conclusions formulated using the words “possibility” and “probability”. The critical relationship of the lawyers toward such conclusions is often associated with the absence of quantitative evaluation of the probability of certain events in medicine. The broad introduction to the expert practice of quantitative and statistical methods of evaluation allows the negative attitude to the probabilistic conclusions in expert practice to be overcome, since a high degree of probability of the fact examined allows it to be considered as reliable. Along with it, the quantitative methods largely facilitate the verification of the expert’s examination.

**References**