



REVIEW ARTICLE

Deontological examination: Clinical and forensic medical diagnosis discrepancies

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Received 16 November 2015; accepted 22 February 2016

KEYWORDS

Forensic medical deontological examination;
Final diagnosis;
Main disease;
Physicians

Abstract *Background:* Globally, the frequency of discrepancies between clinical and forensic medical diagnoses is about 30%. The most common errors made during determination are the main disease pathogenesis and tanatogenesis. *Aims:* To identify the causes of incorrect diagnosis determination and suggest the rules for the precise diagnosis formulation. *Materials and methods:* A retrospective analysis of the forensic medical deontological examinations from the case history data of the State Forensic Medicine Service has been done from 1984 to 2014. There were 1192 forensic medical deontological examinations. A descriptive method was used. The foreign literature data were analyzed in order to compare the results for a comprehensive study. *Results:* 1192 deontological expertise were analyzed during 1984–2014. This study revealed that 37% of clinical and forensic medical diagnoses did not match completely, 24% – matched partially, and 37% – matched. Majority of the discrepancies between diagnoses were identified of surgeons – 13.42%, obstetricians-gynecologists – 8.10%, neurosurgeons – 7.34%, 23% of all cases when a person was treated at the intensive care unit. *Conclusions:* More common discrepancies between diagnoses were identified of surgeons, obstetricians-gynecologists, neurosurgeons and when a person was treated at the intensive care unit. Frequency of discrepancies between clinical and forensic medical diagnoses is growing. The correct formulation of the clinical diagnosis is the first step toward a proper treatment. The final diagnosis should consist of three sections: main disease/injury, pathology followed by the complications and the accompanying conditions of the patient.

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Peer review under responsibility of The International Association of Law and Forensic Sciences (IALFS).

<http://dx.doi.org/10.1016/j.ejfs.2016.02.003>

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Contents

| | |
|--|----|
| 1. Introduction | 00 |
| 2. Methods and materials, aims | 00 |
| 3. Results | 00 |
| 4. The final clinical and forensic medical diagnoses comparing rules | 00 |
| 5. Discussion | 00 |
| 6. Conclusion | 00 |
| Funding | 00 |
| Conflict of interest | 00 |
| References | 00 |

1. Introduction

The diagnosis is a reflection of a physician's and forensic medical doctor's competency and professional skills. Diagnosis (gr. *diagnosis* – cognition) is a brief conclusion about the person's under investigation pathological conditions, existing diseases/injuries or the cause of death. The conclusion is filled in accordance to applicable standards and specified in the terms under the existing disease classifications and nomenclatures.¹ At the same time, it has to be in compliance with the logical sequence of the pathogenesis of the basic disease development.

The basic disease is a specific nosological unit (or its equivalent), written using a certain term which was the initial cause of death (itself directly or through a series of complications which led to death) and proposed by International Classification of Diseases (ICD).

Deontological ethics is the normative ethical position that judges the morality of an action based on the action's adherence to a rule or rules.² Despite the recent advances in medicine and technology, discrepancies between clinical and forensic medical diagnoses remain common.^{3–11} The most common error in determining the final diagnosis is misidentifying the main disease or injury which is dominant or lethal. This is because of the lack of knowledge of the main disease pathogenesis or tanatogenesis.

These errors are usually not recorded. The nonconformity of diagnosis formulation principals to establish the main disease or injury predetermines the discrepancies between clinical and forensic medical diagnoses. The clinically incorrect main disease is coded by the ICD. So these errors become incorrect statistical data. In some clinical cases, during the forensic medical examination diseases or injuries were revealed which were not detected by physicians.^{11–18,20–25}

Similar findings were confirmed in other countries as well. The frequency of clinical and forensic medical diagnosis discrepancies around the world is approximately 30%. One of the reasons is an incorrect clinical diagnosis formulation due to the misinterpretation of the pathogenesis of the disease, proving that the autopsy in forensic medical examination remains the golden standard for improving diagnostics and the formulation of correct clinical diagnosis.^{8,16,23}

This study attempts to emphasize the importance of the forensic medical examination and the clinical diagnosis formulation in medicine. The most common errors made during determination are the main disease pathogenesis and tanatogenesis. This study is important because it reveals that the determined correct main disease provides a high quality of medical care for patients.

2. Methods and materials, aims

A retrospective analysis of the forensic medical deontological examinations from the case history data of the State Forensic Medicine Service has been done during the period 1984–2014. The examinations have been done because of the possibility of incorrect diagnoses. A descriptive method was used. There were 1192 forensic medical deontological examinations, of which discrepancies have been found in more than half of case history data. The foreign literature data were analyzed in order to compare the results for a comprehensive study. The diagnoses discrepancies were classified into three categories: not matching completely, partially matching and matching diagnoses.

The aim is to identify the causes of incorrect diagnosis determination and suggest the rules for the precise diagnosis formulation.

3. Results

In this study were 1192 forensic medical deontological examinations with the possible discrepancies between clinical and forensic medical diagnoses during the period 1984–2014 (Fig. 1). The discrepancies between diagnoses were classified into three categories: not matching completely, partially matching and matching diagnoses. This study revealed that 37% of clinical and forensic medical diagnosis did not match completely, 24% – matched partially, 37% – matched and 2% were not evaluated. Diagnosis discrepancies were due to the incorrectly formulated diagnoses and incorrect determination of the main disease or injury pathogenesis. The most frequent discrepancies between diagnoses were in 2008 and in 2011. This study found out 76% of the patients death. The largest percentage of the discrepancies between diagnoses was 23% of all cases when a person was treated at the intensive care unit.

During 1984–2014 years, discrepancies between diagnoses were similar to other countries.^{12,13,15–27} Majority of the discrepancies between diagnoses were identified of these medical specialists: surgeons – 13.42%, obstetricians-gynecologists – 8.10%, and neurosurgeons – 7.34%.

In the practice of forensic medicine, when performing forensic medical examination of the persons who were treated at hospital, the main question for the forensic medical doctor is “has the disease or injury been correctly diagnosed?”. 37% of forensic medical diagnoses did not match completely with the clinical diagnoses established at medical institutions. The most

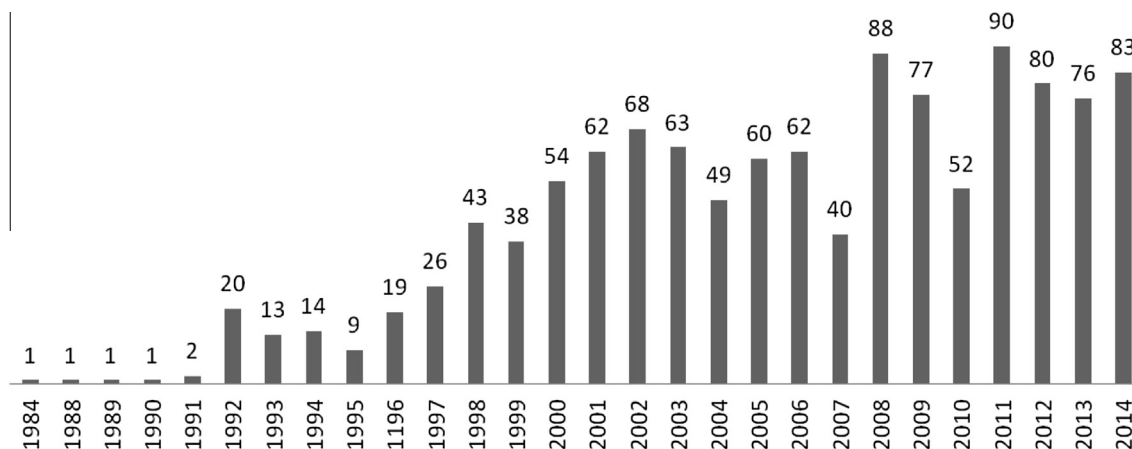


Figure 1 Forensic medical deontological examinations number (units) from 1984 to 2014.

common errors were made when incorrectly identifying the main disease.

In order to determine the final diagnosis, it is important to reveal the disease pathogenesis and in the case of death – tanatogenesis. Therefore, to make the clinical or forensic medical diagnosis the following principles should be followed in order to avoid errors:

- All diagnoses must be unified and correspond exactly to the diagnosis formulation rules and ICD coding. When formulating the diagnosis, unified disease, syndrome or injury titles should be used. Moreover, they should strictly comply with the proposed unified ICD codes.
- In the case of death, only the main disease or injury which directly or through its complications that led to the death of the patient should be specified and its ICD code provided.
- The final diagnosis must consist of three components: (1) the main disease or injury; (2) complications of the main disease or injury and (3) accompanying pathology, the conditions of the patient (specifying the most important).

The main disease or injury is a specific nosological unit (or its equivalent), with the most manifesting symptoms, which are being treated, but can lead to the disturbance of patient's health and conditions that can end up fatal. The main disease or injury must be coded by ICD. However, there are cases when the main disease or injury is composed of several nosological units. In such cases, the combined main diseases that may be presented in the three possible versions should be identified. The versions are competitive, cumulative and background diseases.

- Competitive diseases refer to the diseases that the patient was ill from at the same time and each of them individually could certainly lead to the patient's death.
- Cumulative diseases refer to several diseases which have developed at the same time, holding the role of paramount importance in the disease pathogenesis. These two or more diseases combined together led to the death and each of them developing separately would not have been fatal.
- Background diseases refer to those diseases which are not etiologically related to the main disease. However, in the overall pathogenesis with the main disease, it was one of

the reasons for its development. It aggravated the progress and contributed to the development of fatal complications provoking death eventually. For example, the most common background diseases are hypertension and diabetes mellitus.

When formulating the combined diagnosis, it is important to remember that statistics may consider only the disease or injury as the primary cause of death, which is written in the first part of the diagnosis. In such cases, in order to maintain the statistics as accurate as possible, physicians and forensic medical doctors suggest to prioritize the disease or injury which was of the greatest significance for the disease or injury pathogenesis.

The complication of the main disease or injury is a nosological unit, a trauma, a syndrome, a symptom or a thanatological process, which directly or indirectly was related to the main disease, but was not the expression of it. The most important complications of the main fatal disease or injury, which directly related to the cause of death, should be recorded the last.

Comorbidities and the conditions of the patient are one or several nosological units which in case of death were not directly related to the main disease and not directly involved in tanatogenesis, but the certain treatment and diagnostic procedures were imposed. It is important to note that the comorbidity cannot have fatal complications. Any other pathological conditions which existed along with the disease such as pre-existing injuries and their complications, appendectomy, gastrectomy or eye surgery data should also be noted.

4. The final clinical and forensic medical diagnoses comparing rules

After forensic medical examination, the forensic medical doctors must compare the final clinical diagnosis written in case history and the forensic medical diagnosis in all three sections separately (the main disease or injury, complications and the accompanying pathology or condition). If all nosological units, its terms and codes for each of the sections correspond, it is considered that clinical and forensic medical diagnosis matched. If not, it is considered a discrepancy between

diagnoses. In the case of main combined diseases, where one of the diseases from competitive, cumulative or background disease as well as their hyperdiagnostics was not mentioned, it is considered as a discrepancy between diagnoses too.

A discrepancy between the diagnoses is considered in the case of any of the nosological units of the diagnosis sections with fundamental mismatch according to the localization, etiology, pathological process as well as late and untimely determination of diagnosis of the main disease or injury. If a forensic medical doctor analyzes the false of clinical diagnoses, mismatched diagnoses can be divided into three discrepancies categories.

- I Diagnoses discrepancies category is recorded during the short-term patient stays at hospital, when physicians due to the short period of time have not been able to determine the correct diagnosis, and a diagnostic error did not interfere with the disease outcome. The final clinical diagnosis requires a period of three days. This period of up to three days corresponds to the relatively short-term patient stay at hospital.
- II Diagnoses discrepancies category is established in cases where the correct diagnosis in the relevant medical institution was possible, but a diagnostic error did not affect the essential outcomes of the disease.
- III Diagnoses discrepancies category is established in cases where the correct diagnosis in the relevant medical institution was possible, but a diagnostic error led to the incorrect treatment, which was important for the development of fatal outcomes of the disease.

It is important to consider the reasons for which diagnostic errors occur. When analyzing diagnostic errors, two types of causes can be distinguished: objective and subjective. The first category is always caused by objective reasons. The second and third categories may be due to both objective and subjective reasons. The objective reasons have three major groups, and subjective – six.

- The objective reasons of diagnostic errors: the short-term stay in hospital by the patient, severe condition of the patient. Other objective diagnostic problems: hardware failure during diagnostic investigation, atypical or mild symptoms of the disease, a rare nosological form.
- The subjective reasons of diagnosis errors: lack of patient examination, inadequate anamnesis data evaluation, incorrect assessment of clinical data, incorrect evaluation of test results, incorrect evaluation of consultant's conclusion, incorrect formulation of the final clinical diagnosis.

According to Goldman classification, clinical diagnosis classification versus autopsy findings, the following types of errors and classes can be put forward: two major types (classes 1 and 2), three small types (classes 3, 4 (a) and 4 (b)) and the absence of errors (class 5). Class 1: directly related to death, if recognized, may have altered treatment or survival (eg., unsuspected myocardial infarction presenting with chest pain). Class 2: directly related to death, but even if recognized would not have altered treatment or survival (eg., unsuspected

myocardial infarction presenting with cardiac arrest). Class 3: incidental autopsy findings not directly related to death but related to terminal disease process (eg., known myocardial infarction with unsuspected left ventricular mural thrombus). Class 4 (a): incidental autopsy finding unrelated to the cause of death (eg., known myocardial infarction with unsuspected lung cancer). Class 4 (b): incidental autopsy finding contributing to death in an already terminally ill patient (eg., unsuspected aspiration pneumonia in an already terminally ill patient). Class 5: clinical and autopsy diagnoses in complete agreement.²²

5. Discussion

Despite the progress in various medical areas and patient treatment, the diagnostic formulation errors remain frequent. Working closely together, the physicians along with the forensic medical doctors could improve the differential diagnosis of certain diseases, the prevention of treatment errors, and prevention of misdiagnosing, which would lead to containing more accurate statistics of the diseases and death. In an uncertain disease case, physicians should be more interested in the autopsy findings. Despite the technological and scientific progress, the frequency of false diagnoses has not diminished over several decades. An autopsy as a diagnostic investigation also has a 1–5% error in determining the cause of death and comorbidities. Globally, the frequency of discrepancies between clinical and forensic medical diagnoses is about 30%, so the autopsy remains a golden standard for improving diagnostics and clinical diagnosis formulation. A higher number of forensic medical examinations could help determine unnoticed or unsuspected clinical conditions and diseases, which courses could be atypical. In order to avoid diagnostic errors, hospital administration should be concerned and organize more medical conferences for both forensic medical doctors and physicians to discuss various fatal cases which happened to the patients during emergency medical assistance, comparing the clinical and autopsy data.

6. Conclusion

More common discrepancies between diagnoses were identified of surgeons, obstetricians-gynecologists, neurosurgeons and when a person was treated at the intensive care unit. Frequency of discrepancies between clinical and forensic medical diagnoses is growing. The diagnosis is a reflection of physician's and forensic medical doctor's competency and professional skills. The correct formulation of the clinical diagnosis is the first step toward a proper treatment. The most common discrepancies between clinical and forensic medical diagnoses are due to determined false final diagnosis, which was influenced by objective reasons.

Funding

None.

Conflict of interest

None declared.

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