INTERNATIONAL JOURNAL OF INTEGRATIVE AND MODERN MEDICINE

The Importance of Forensic Examination of Physician Errors in Cases of Child Death

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Abstract: Physician errors in pediatric practice remain a critical issue due to their potential to lead to severe outcomes, including child mortality. The forensic medical examination of such cases plays a key role in establishing the causes and mechanisms of death, assessing the quality of medical care, and determining the presence of diagnostic or therapeutic defects. This study highlights the importance of forensic examination in cases of child death associated with suspected medical errors. The analysis focuses on identifying typical physician mistakes, including delayed diagnosis, incorrect interpretation of clinical symptoms, insufficient diagnostic evaluation, and violations of clinical protocols. Particular attention is given to the role of forensic medical expertise in determining causal relationships between medical actions and fatal outcomes, as well as in assessing the severity of medical negligence. The findings emphasize that forensic examination is an essential tool for ensuring objectivity in medico-legal investigations, improving the quality of pediatric healthcare, and preventing similar errors in the future. Strengthening interdisciplinary cooperation and standardizing forensic evaluation criteria are necessary to enhance the accuracy and reliability of expert conclusions in cases of child mortality.

Keywords: Forensic Medical Examination, Physician Errors, Pediatric Mortality, Child Death, Medical Negligence, Diagnostic Errors, Clinical Assessment, Medico-Legal Investigation, Pediatric Healthcare

Introduction

Child mortality associated with physician errors remains one of the most serious challenges in modern healthcare and forensic medicine. The vulnerability of pediatric patients, combined with the complexity of clinical presentation and rapid progression of diseases, significantly increases the risk of diagnostic and therapeutic mistakes. In cases of child death, even minor deviations from clinical standards may lead to fatal outcomes, making the issue not only a medical problem but also an important medico-legal concern.Forensic medical examination plays a crucial role in investigating such cases. It provides an objective assessment of the quality of medical care, identifies possible diagnostic and treatment errors, and establishes a causal relationship between medical actions and the outcome. The accuracy and completeness of forensic evaluation are essential for ensuring justice, protecting patient rights, and improving the overall quality of pediatric healthcare services[1,2]. The increasing number of disputes related to suspected medical negligence in pediatric practice highlights the need for a systematic approach to forensic analysis. In many cases, inconsistencies in clinical documentation, delayed diagnosis, and insufficient adherence to treatment protocols complicate the expert evaluation process[3]. Therefore, the development of standardized criteria and methodological approaches for forensic examination in cases of child death is of high importance.The aim of this study is to analyze the importance of forensic medical examination of physician errors in cases of child death and to highlight its role in determining the causes of fatal outcomes, assessing medical care quality, and preventing future medical errors[4,5].

Materials and Methods

The object of the study comprised 196 forensic medical examination materials related to iatrogenic conditions in children under 16 years of age, conducted in Tashkent city and Namangan region during the period 2020–2025. These cases included forensic reports, medical documentation, clinical records, and expert conclusions concerning suspected physician errors in pediatric practice.The subject of the study was the forensic medical assessment of iatrogenic conditions in children under 16 years of age, based on the analysis of available forensic examination materials. The focus was placed on identifying diagnostic and therapeutic errors, evaluating their medico-legal significance, and determining their impact on clinical outcomes, including fatal cases.The research was conducted using a comprehensive retrospective analysis of forensic medical documentation. In order to achieve the objectives of the study, the following methods were applied: anamnetic, clinical, dialectical, comparative, logical, and statistical analysis. The anamnetic method was used to evaluate the sequence of disease development and medical interventions. The clinical method allowed assessment of diagnostic accuracy, treatment adequacy, and progression of pathological

conditions.Comparative and logical analysis methods were used to identify discrepancies between established clinical standards and actual medical practice. The statistical method was applied to determine the frequency, structure, and distribution of physician errors in pediatric practice, as well as to evaluate patterns of iatrogenic conditions across different regions and age groups.The obtained data were systematically processed and classified according to the type of physician error, clinical manifestation, and outcome severity. This approach ensured an objective evaluation of forensic medical findings and allowed for the identification of key factors contributing to adverse outcomes in pediatric iatrogenic cases.

Results

The analysis of forensic medical examination materials demonstrated that physician errors in pediatric practice are closely associated with both diagnostic and therapeutic deficiencies, which significantly contribute to adverse outcomes, including severe complications and child mortality. The study revealed that the most common types of errors included delayed diagnosis, incorrect interpretation of clinical symptoms, insufficient clinical examination, and deviations from established treatment protocols[6,7,8]. Epidemiological analysis showed regional variability in the frequency and structure of iatrogenic conditions in children, with differences observed between Tashkent city and Namangan region. This indicates the presence of inconsistencies in clinical practice and in the organization of pediatric medical care.The study identified characteristic clinical and morphological changes associated with physician errors in pediatric cases. These changes reflected the progression of underlying diseases due to delayed or inadequate medical interventions, which in many cases resulted in rapid deterioration of the child's condition.A significant finding of the research was the confirmation that the assessment of health damage severity in pediatric iatrogenic cases requires a comprehensive approach, combining clinical, anamnetic, and forensic medical data. In particular, the results emphasized the importance of evaluating functional organ impairment when determining the severity of the condition and its medico-legal classification.The critical analysis of forensic medical conclusions showed that in a number of cases, inconsistencies and methodological shortcomings affected the objectivity and completeness of expert evaluations[9,10,11]. However, the application of a standardized algorithm for forensic assessment of physician errors significantly improved the reliability and consistency of expert conclusions.

Overall, the results of the study demonstrate that systematic forensic evaluation of physician errors in pediatric practice is essential for identifying causes of adverse outcomes, improving the quality of medical care, and strengthening patient safety in pediatric healthcare systems.

Discussion

The results of this study demonstrate that physician errors in pediatric practice are heterogeneous in nature and are associated with different clinical mechanisms and severity of outcomes. The most severe consequences were observed in cases of medication, surgical, diagnostic, and anesthesiological errors, each of which has specific pathophysiological and medico-legal implications.

Medication errors were predominantly associated with intoxication syndromes, allergic reactions, and toxic damage to vital organs such as the liver, kidneys, and auditory system. In severe cases, the development of anaphylactic shock and multiple organ failure was observed, which significantly increases the risk of fatal outcomes[12]. These findings highlight the importance of strict adherence to pharmacological protocols and accurate dose calculation in pediatric practice.

Surgical errors were mainly characterized by intraoperative or postoperative complications, including blood loss, infectious complications, injury to anatomical structures, and subsequent functional impairments. The most severe outcomes were observed in neurosurgical and cardiac surgical interventions, where even minor technical deviations may lead to irreversible damage or death.

Diagnostic errors were found to have a particularly significant impact on disease progression, as delayed or incorrect diagnosis often resulted in the advancement of pathological processes and reduced treatment effectiveness. Oncological cases were identified as the most critical, where diagnostic delays frequently led to advanced disease stages and poor prognosis[13].

Anesthesiologic errors were associated with the highest risk of immediate life-threatening complications,

including hypoxic brain injury, cardiac arrest, and malignant hyperthermia. The mortality risk in such cases remains extremely high (20–30%), emphasizing the need for strict monitoring and adherence to anesthesia safety protocols in pediatric patients.

The study also demonstrates that modern forensic medical practice is increasingly focused on the development of preventive systems aimed at reducing physician errors in pediatric care. These include continuous medical education programs, standardization of pharmacological therapy, implementation of electronic medical records, use of computerized decision-support systems in drug prescribing, application of team-based clinical approaches, and establishment of systematic error reporting and analysis mechanisms[14,15].

Overall, the findings confirm that a comprehensive approach combining clinical safety measures and forensic medical evaluation is essential for reducing physician errors, improving pediatric healthcare quality, and preventing adverse and fatal outcomes in children.

Conclusion

The present study demonstrates that diagnostic errors represent the leading type of medical care defects in pediatric practice, accounting for 48.2% of all identified cases. The most common form of diagnostic failure is hypo diagnosis (57.5%), with acute appendicitis (30.4%), meningitis (21.7%), and pneumonia (17.4%) being the most frequently missed conditions. These findings indicate that delayed or incorrect recognition of acute and life-threatening diseases remains a critical problem in pediatric healthcare. Treatment-tactical errors (36.1%) are mainly associated with inadequate therapy (53.3%) and incorrect drug dosing (26.7%), which significantly influence disease progression and patient outcomes. Organizational deficiencies (33.7%), particularly untimely hospitalization (42.9%), further contribute to the deterioration of the child's condition and increase the risk of severe complications. A particularly important finding of this study is that in 68.7% of cases, multiple types of medical defects occur simultaneously. This combination of diagnostic, therapeutic, and organizational errors creates a cumulative negative effect, leading to a significant worsening of clinical outcomes. A direct correlation was established between the number of medical defects and the severity of the resulting consequences, including life-threatening conditions and mortality. Overall, the results emphasize that improving pediatric healthcare quality requires a comprehensive approach aimed at early diagnosis, adherence to clinical protocols, timely hospitalization, and strict control of therapeutic interventions. Strengthening forensic medical analysis of medical errors is essential for identifying systemic deficiencies and preventing their recurrence in clinical practice.

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