

Defects in Medical Care in Pediatric Practice: Results of a Forensic Medical Analysis

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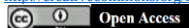
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ABSTRACT

Forensic medical analysis of defects in medical care in pediatric practice makes it possible to characterize their structure, causes, clinical significance, and consequences. This retrospective study analyzed 196 forensic medical examination materials concerning children younger than 16 years who were examined in Tashkent City and Namangan Region during 2020–2025. Among these, 167 cases involved provision of medical care and were analyzed with respect to the nature and causes of defects, the healthcare setting, and the specialty of the healthcare professionals involved. The most frequent defects were delayed diagnosis (40.7%), failure to identify complications of the underlying disease or injury (12.6%), and delayed hospitalization (11.4%). The principal contributing factors were insufficient professional competence of healthcare workers (30.5%), inadequate attention to the patient (24.6%), and deficiencies in the organization and continuity of diagnostic and treatment processes (21.0%).

Introduction

Timely identification of medical errors and defects in medical care in pediatric practice is essential for preventing severe complications and death in children. The anatomical and physiological characteristics of children, the rapid progression of many diseases, and the nonspecific nature of clinical manifestations in some conditions place particularly high demands on diagnostic and therapeutic decision-making. Retrospective analysis of forensic medical examination materials is an important source for an objective assessment of the quality of medical care and the relationship between identified defects and clinical outcomes.

Aim of the study

To retrospectively analyze forensic medical examination materials concerning children younger than 16 years in Tashkent City and Namangan Region during 2020–2025, to determine the structure and causes of defects in medical care, and to develop practical recommendations for their prevention.

Materials and Methods

The study included 196 forensic medical examination materials concerning children younger than 16 years from Tashkent City and Namangan Region for the period 2020–2025. The analysis included sex, age, time and place of the incident, place of death, healthcare-seeking status, duration of treatment, nature and cause of defects in medical care, their effect on the outcome, and the specialty of the healthcare professional who provided medical care. Statistical indicators were presented as absolute numbers and percentages.

Results

Among the 196 cases analyzed, 131 (66.8%) involved boys and 65 (33.2%) involved girls. Children aged 1–3 years predominated, accounting for 89 cases (45.4%). Neonates aged 0–28 days

accounted for 29 cases (14.8%); children aged 29 days to 1 year, 54 cases (27.6%); those aged 3–7 years, 13 cases (6.6%); those aged 7–10 years, 4 cases (2.0%); and those aged 10–16 years, 7 cases (3.6%).

Table 1. Age distribution of children

Age group	n	%
0–28 days	29	14.8
29 days–<1 year	54	27.6
1–3 years	89	45.4
3–7 years	13	6.6
7–10 years	4	2.0
10–16 years	7	3.6
Total	196	100.0

Analysis of the time of occurrence showed that the largest number of cases was recorded between 00:00 and 06:00—74 cases (37.8%)—and between 19:00 and 24:00—63 cases (32.1%). Between 07:00 and 12:00, 36 cases (18.4%) were recorded, while 23 cases (11.7%) occurred between 13:00 and 18:00. In total, 188 incidents (95.9%) occurred at home, whereas 8 (4.1%) occurred in other locations.

Table 2. Time of occurrence of incidents

Time interval	n	%
00:00–06:00	74	37.8
07:00–12:00	36	18.4
13:00–18:00	23	11.7
19:00–24:00	63	32.1
Total	196	100.0

Regarding healthcare-seeking, medical care was sought in 167 cases (85.2%), whereas no medical care was sought in 29 cases (14.8%). Among the 167 cases in which medical care was provided, the duration of treatment was up to 1 day in 69 cases (41.3%), 2–3 days in 57 (34.1%), 4–7 days in 17 (10.2%), and more than 8 days in 24 (14.4%).

Table 3. Duration of treatment among cases receiving medical care

Duration	n	%
Up to 1 day	69	41.3
2–3 days	57	34.1
4–7 days	17	10.2
>8 days	24	14.4
Total	167	100.0

Analysis of the nature of defects in medical care showed that delayed diagnosis accounted for the largest proportion—68 cases (40.7%). Failure to identify complications of the underlying disease or injury was recorded in 21 cases (12.6%), delayed hospitalization in 19 (11.4%), and failure to identify the underlying disease or injury in 17 (10.2%). Inadequate management of childbirth was identified in 13 cases (7.8%), failure to identify clinically significant comorbidities in 11 (6.6%), inappropriate use of medications in 9 (5.4%), deficiencies in the prescription or performance of medical procedures in 7 (4.2%), and deficiencies in immunoprophylaxis in 2 cases (1.2%).

Table 4. Nature of defects in medical care

Type of defect	n	%
Underlying disease/injury not identified	17	10.2
Complication of underlying disease/injury not identified	21	12.6
Clinically significant comorbidity not identified	11	6.6

Delayed diagnosis	68	40.7
Delayed hospitalization	19	11.4
Inadequate management of childbirth	13	7.8
Deficiencies in prescribing/performance of medical procedures	7	4.2
Inappropriate use of medications	9	5.4
Deficiencies in immunoprophylaxis	2	1.2
Total	167	100.0

Among the causes of defects, insufficient professional competence of healthcare workers ranked first, accounting for 51 cases (30.5%). Inadequate attention to the patient was identified in 41 cases (24.6%), deficiencies in the organization of diagnostic and treatment processes and lack of continuity in 35 (21.0%), lack of therapeutic resources in 12 (7.2%), lack of diagnostic resources in 10 (6.0%), delayed presentation for medical care in 8 (4.8%), atypical disease course in 6 (3.6%), and objective difficulties in providing medical care in 4 cases (2.4%).

Table 5. Causes of defects in medical care

Cause	n	%
Inadequate attention to the patient	41	24.6
Insufficient professional competence of healthcare workers	51	30.5
Deficiencies in organization of diagnostic/treatment processes and lack of continuity	35	21.0
Lack of diagnostic resources	10	6.0
Lack of therapeutic resources	12	7.2
Delayed presentation for medical care	8	4.8
Atypical course of disease/injury	6	3.6
Objective difficulties in providing medical care	4	2.4
Total	167	100.0

With respect to the effect of defects in medical care on outcomes, the defect was considered a direct cause of death in 66 cases (39.5%) and a substantial contributing factor predisposing to death in 62 cases (37.1%). Disability occurred in 16 cases (9.6%), while prolonged treatment was recorded in 12 cases (7.2%). In 11 cases (6.6%), the identified defect had no effect on the outcome.

Among the healthcare professionals who provided medical care, pediatricians accounted for the largest proportion 87 cases (52.1%). General practitioners were involved in 40 cases (24.0%), obstetricians-gynecologists in 11 (6.6%), neonatologists in 11 (6.6%), intensivists in 6 (3.6%), otorhinolaryngologists in 3 (1.8%), cardiologists in 2 (1.2%), internists in 2 (1.2%), and functional diagnostics specialists in 1 case (0.6%).

Discussion

The findings indicate that defects in pediatric medical care identified through forensic medical examination are predominantly associated with diagnostic and organizational processes. Delayed diagnosis was the most frequent defect in the analyzed cases. This finding is consistent with contemporary patient-safety literature emphasizing diagnostic error as an important source of preventable harm in children. Pediatric diagnostic errors may arise from failures in information gathering, interpretation, follow-up, communication, and coordination of care.

The predominance of organizational and professional factors in the present study also corresponds to international evidence showing that pediatric care is particularly vulnerable to communication failures, interruptions, transitions of care, and other system-level factors.

The high proportion of defects associated with delayed diagnosis and inadequate recognition of complications underscores the importance of structured diagnostic pathways, reassessment of children with worsening or atypical symptoms, and effective continuity between primary care, emergency

services, and inpatient care. International pediatric emergency-care research similarly identifies management and diagnostic problems among important categories of preventable adverse events.

Medication-related defects represented a smaller proportion of the cases in this study; nevertheless, pediatric patients remain particularly vulnerable to medication errors because dosing frequently depends on body weight and because safe medication use requires appropriate prescribing, dispensing, administration, and monitoring.

Conclusion

The analysis of 196 forensic medical examination materials from Tashkent City and Namangan Region for 2020–2025 demonstrated that defects in pediatric medical care were predominantly related to diagnostic and organizational processes. Among the 167 cases in which medical care was provided, delayed diagnosis was the most common defect (40.7%). The principal causes were insufficient professional competence of healthcare workers (30.5%), inadequate attention to the patient (24.6%), and deficiencies in the organization and continuity of diagnostic and treatment processes (21.0%). In 39.5% of cases, the defect was considered a direct cause of death, while in a further 37.1% it substantially contributed to the fatal outcome. These findings support the need to improve the quality and timeliness of pediatric care, implement structured early-diagnosis algorithms, strengthen continuing professional education, standardize monitoring of critically ill children, and improve continuity between healthcare levels. In forensic medical examination, the causal relationship between a defect in medical care, its cause, and the resulting outcome should be assessed using standardized criteria.

Practical recommendations

- Strengthen clinical algorithms aimed at early detection of disease in children and prevention of delayed diagnosis.
- Provide regular continuing professional education in pediatrics for general practitioners and other specialists involved in child healthcare.
- Standardize the frequency of monitoring and assessment of vital signs in critically ill children.
- Improve diagnostic and therapeutic continuity between primary care, emergency medical services, and inpatient facilities.
- Establish standardized criteria for forensic assessment of the causal relationship between a defect in medical care, its underlying cause, and the clinical outcome.

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