

CLINICAL AND EPIDEMIOLOGICAL FEATURES OF POSTTRAUMATIC PANCREATITIS IN CHILDREN

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Abstract. The purpose of the study. To comprehensively characterize the clinical and epidemiological features of post-traumatic pancreatitis (PTP) in children, assess the diagnostic value of laboratory and instrumental methods, and the frequency of local complications depending on the severity of pancreatic damage. Material and methods. A retrospective-prospective single-center analysis of 184 children aged 1–17 years with post-traumatic pancreatitis treated in 2010–2025 was conducted. Results. Post-traumatic pancreatitis is more often diagnosed in schoolchildren and adolescents: the age of 11–17 years was 65.8 % (121 children), the peak of the disease occurred in the group of 11–14 years - 34.8 % (64 children). Conclusions. Post-traumatic pancreatitis in children develops mainly in boys aged 11–14 years against the background of blunt abdominal trauma of the "steering wheel" type and is characterized by a high proportion of AAST grade III–IV injuries and a significant frequency of local complications (pseudocysts, fistulas).

Keywords: children; blunt abdominal trauma; post-traumatic pancreatitis; pancreas; AAST; pseudocysts; pancreatic fistula; organ-preserving surgery.

Introduction. Blunt abdominal trauma remains one of the key causes of emergency hospitalization in children and adolescents, accounting for a significant share of pediatric injuries and contributing to a steady increase in mortality and disability in the pediatric population. [1-3, 5]. Against this background, pancreatic (pancreatic) injuries are relatively rare - according to various authors, in no more than 1-3% of all abdominal injuries in children, however, they are associated with a high risk of severe local and systemic complications requiring long-term treatment and often repeated interventions [3, 4, 6, 7].

The purpose of the study. To comprehensively characterize the clinical and epidemiological features of PTP in children, to assess the diagnostic value

of laboratory and instrumental methods and the frequency of local complications depending on the severity of pancreatic damage.

Material and methods. A retrospective-prospective single-center analysis of 184 children aged 1–17 years with post-traumatic pancreatitis treated in 2010–2025 was conducted. The average age was 11.6 ± 3.8 years; there were 118 boys (64.1%) and 66 girls (35.9%), with a sex ratio of approximately 1.8:1. The study examined the age and sex distribution, mechanisms of injury, clinical presentation, dynamics of pancreatic enzymes (blood amylase and lipase, urine amylase), ultrasound and multislice computed tomography data, AAST score assessment, complications, and outcomes.

Results. Post-traumatic pancreatitis was more often diagnosed in schoolchildren and adolescents: the age of 11–17 years was 65.8 % (121 children), the peak of the incidence was in the group of 11–14 years - 34.8 % (64 children). Boys significantly prevailed (64.1 %), which is associated with greater physical activity and prevalence of street and sports injuries.

The leading mechanism of pancreatic damage was "handlebar trauma" - a blow to the stomach from the handlebars of a bicycle: 120 cases (65.2 %). Household injuries (falls, compression of the trunk) were noted in 38 children (20.7 %), sports injuries - in 17 (9.2 %), traffic accidents - in 9 (4.9 %). In some patients with steering trauma, the skin symptom of the "steering arc" in the epigastrium (7.6%) was recorded, which was associated with more severe injuries (III–IV degree of AAST).

The clinical picture of PTP was typical: 87.5% of children reported epigastric/subcostal pain, 76.6% reported nausea/vomiting, 45.1% reported subfebrile fever, 31.5% reported abdominal distension, and 21.2% reported moderate abdominal wall muscle tension. Children of the younger age group (up to 5 years old) were more likely to have erased symptoms - refusal to eat, lethargy, moderate abdominal pain, which made early diagnosis difficult and required dynamic monitoring.

All pancreatic enzymes in patients with PTP were significantly elevated compared to the control group ($p < 0.001$). On the 1st day, the average blood amylase

level was 1340 ± 280 U/L, urine amylase was 1860 ± 310 U/L, and blood lipase was 980 ± 230 U/L, gradually decreasing by the 5th to 7th day in patients with a favorable course. The most informative marker of early diagnosis and persistent inflammation was urine amylase, which remained elevated for up to 5 days and was associated with the risk of a complicated course.

According to the AAST scale, the distribution of pancreatic damage was as follows: grade I - 15.8%, grade II - 22.3%, grade III - 29.3%, grade IV - 22.8%, and grade V - 9.8%. Thus, more than half of the patients (52.1%) were diagnosed with grade III-IV damage, which required an active approach and a high level of surgical readiness; severe grade V damage accounted for 9.8% and was associated with a high risk of enzymatic peritonitis and fistula complications.

Pancreatic pseudocysts were formed in 43 children (23.4%), mainly against the background of grade IV–V injuries. Of these, 17 (less than 30 mm) were successfully observed conservatively, 15 (30–50 mm) underwent a minimally invasive puncture under ultrasound navigation, 11 (more than 50 mm; 6.0% of the total cohort) required surgical drainage.

From a therapeutic point of view, 112 children (60.9%) received conservative tactics, 72 (39.1%) received surgical intervention. A control subgroup (standard suturing and drainage methods, $n=34$) and the main subgroup (organ-preserving technique with a Z-shaped suture, covering the defect with a vascularized omentum and local sealing) were identified within the surgical group Blood Stop®, $n=38$). The use of organ-preserving techniques significantly reduced the incidence of pancreatic fistulas, pseudocysts, repeated surgeries, and prolonged hyperfermentemia compared to standard treatment ($p<0.05$), indicating its superiority in severe post-traumatic pancreatic injuries.

Conclusions

Post-traumatic pancreatitis in children develops predominantly in boys aged 11–14 years against the background of blunt abdominal trauma of the "steering wheel" type and is characterized by a high proportion of AAST grade III–IV injuries and a significant frequency of local complications (pseudocysts, fistulas). Early

assessment of pancreatic enzymes (**especially urine amylase**) in combination with **ultrasound and MSCT is the key to timely diagnosis and management**. Organ-preserving surgical technique with local sealing of the pancreatic defect and omental cover improves immediate treatment outcomes and reduces the risk of fistula and cystic complications in children with severe post-traumatic pancreatic injuries.

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