



INTRA-ABDOMINAL HYPERTENSION IN CHILDREN IN THE PERIOPERATIVE PERIOD DURING OPERATIONS ON THE ABDOMINAL CAVITY

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Summary: *This article is devoted to the problems of intra-abdominal hypertension and changes in intra-abdominal pressure during abdominal surgery in children. The article deals with the historical aspects of the formation of abdominal perfusion pressure, intra-abdominal hypertension, abdominal hypertension syndrome. The pathophysiological mechanisms of the influence of intra-abdominal hypertension on various systems are outlined. The current state of the problem, the debatability of physiological and pathophysiological parameters in children are described. Particularly noted is the insufficient number of studies on this topic in pediatric patients, due to the lack of a unified approach to measuring pressure, as well as specialized consumables.*

Key words: *intra-abdominal pressure, abdominal perfusion pressure, abdominal surgery, peritonitis.*

Abdominal perfusion pressure is the difference between mean arterial pressure and IAP. This indicator is similar to the indicator of cerebral perfusion pressure, which is actively used in neurosurgery and characterizes the level of blood supply to brain tissues. By analogy, abdominal perfusion pressure characterizes the perfusion of abdominal tissues and is associated with local ischemia. Normal values for adult patients are more than 60 mm Hg. Intra-abdominal hypertension is a persistent increase in IAP up to 12 mm Hg and more, which is recorded with at least 3 standard measurements with an interval of 4-6 hours. In turn, it is divided into 4 degrees: the 1st degree is characterized by intravesical pressure from 12 to 15 mm Hg, 2nd degree - 16-20 mm Hg, 3rd degree - 21-25 mm Hg, 4th degree - more than 25 mm Hg.

Features of IAP indicators in children

The problem of increased IAP in children is less studied than in adult patients, but is just as relevant. Most likely, this is due to the fact that, until now, not all physiological parameters discussed in our review have been standardized for childhood. This is dictated by the small number of studies and the lack of a unified approach to measuring pressure in them, as well as the lack of specialized consumables - ureometers used for bedside IAP measurement are more suitable for adult patients due to their volume and graduation.



In the case of adult patients, the measurement technique is standardized - measurement of pressure in the bladder with a preliminary injection of 25–50 ml of sterile saline into it is generally accepted. When measured in this way, the middle axillary line is taken as the zero mark, and the data obtained are given in millimeters of mercury. The position of the patient at the time of measurement should be strictly horizontal on the back.

For children, the most common method has been changed as follows: the volume of sterile saline injected into the bladder is determined at the rate of 1 ml per 1 kg of the child's body weight.

Normal IAP values of healthy children, including newborns, usually do not differ significantly from those of adults and are about 5 mm Hg.

The data of various researchers on the development of the syndrome of intra-abdominal hypertension in newborns are contradictory. According to some authors, it is necessary to focus on IAP numbers of about 20 mm Hg. In particular, M. Olisevich et al published a paper on IAP monitoring during surgery in 42 newborns with abdominal wall defects and concluded that an IAP level exceeding 20 mm Hg associated with a critical increase in the frequency of complications. At the same time, other researchers talk about the development of intra-abdominal hypertension and intra-abdominal hypertension syndrome in newborns with significantly lower pressure in the abdominal cavity - 10–15 mm Hg.

As a prophylaxis of visceroperitoneal disproportions in congenital defects of the anterior abdominal walls in the literature describes many methods that can be considered as decompression. At present, the most widespread use of so-called Silo bags for stage plasty of the anterior abdominal wall. By sterile films, polypropylene meshes are used in a similar technique.

Thus, IAP leads to a violation of the vital functions of the body and is a pathology with high risk of adverse outcomes, requiring timely diagnosis and immediate treatment. Main causes of IAP in adults are severe trauma to the abdominal organs, bone fracture pelvis, bleeding into the abdominal cavity and retroperitoneal space, rupture of an aneurysm of the abdominal aorta, peritonitis, destructive pancreatitis, burns over 60% of the surface body, massive infusion therapy. In pathogenesis significant reduction in elasticity anterior abdominal wall, accumulation of abnormal fluid or gas in the abdominal cavity, increased content abdominal cavity, the development of capillary leakage. IAP leads to a vicious circle. Organ dysfunction that occurs during development, is a consequence of the influence of the IAP indirectly on all body systems. Interest in WBG appeared at the end of the 19th century, methods its prevention and treatment in children. The methods and norms of determination in children are not defined. Certainly in children there are specific etiological factors of the disease and malformations in which IAP is possible. Everybody these circumstances dictate the need for intensive further research. IAP measurement should become a routine method for assessing the condition of a patient in the intensive care unit.

IAP measurement in pediatric surgery and anesthesiology-resuscitation



According to a survey of German pediatric resuscitators, only about 20% of physicians routinely measure IAP.

Most often, IAP measurement is performed intraoperatively in children with gastroschisis and omphalocele to make a decision on the volume of organs and tissues to be submerged. However, the high prognostic and diagnostic efficiency of this procedure as a predictor and sign of the development of severe complications allows us to offer it for use in a much wider range of indications. Indicators of IAP can be used as one of the markers for reducing the effects of intestinal paresis, a criterion for the risk of developing anastomotic failure, a criterion for the risk of developing bacterial translocation and sepsis, and one of the signs of perforation of a hollow organ.

A fairly large number of works have been devoted to the study of changes in IAP during the development of peritonitis in adult surgery. According to the literature, peritonitis leads to the development of intra-abdominal hypertension in 64% of cases. With this combination of complications, mortality during treatment reaches 42-68%, and without treatment - 100%.

In pediatric surgery, the number of such works is limited.

An article by P. Deindl et al, which demonstrated the effectiveness of measuring IAP in children after liver transplantation, can be cited as an example of high-quality practical work. A relationship between an increase in IAP and a latent pain syndrome in a patient was revealed, which made it possible to optimize analgesic therapy and obtain the opposite result in the form of a decrease in intra-abdominal hypertension. Against the background of normalization of IAP, patients showed an improvement in splanchnological blood flow

Conclusion

The presented works open up a wide field for studying the issues of IAP, intra-abdominal hypertension syndrome, abdominal perfusion pressure in children undergoing abdominal surgery. Issues of particular relevance include: clarification of normal IAP indicators for different age periods; measurement of IAP during various operations on the abdominal cavity in the case of an uncomplicated course of the postoperative period; change in IAP numbers with the development of peritonitis in children; the relationship between the dynamics of changes in abdominal perfusion pressure and other indicators of recovery of the passage along the gastrointestinal tract in the early postoperative period.

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