INTERNATIONAL MULTIDISCIPLINARY JOURNAL FOR RESEARCH & DEVELOPMENT
SJIF 2019: 5.222 2020: 5.552 2021: 5.637 2022:5.479 2023:6.563 2024: 7,805
eISSN :2394-6334 https://www.ijmrd.in/index.php/imjrd Volume 11, issue 09 (2024)

PHASE CHARACTERISTICS OF CLINICAL MANIFESTATIONS AND CHANGES IN VEGETATIVE HOMEOSTASIS IN CHILDREN WITH SEVERE FORMS OF INTESTINAL INFECTIONS USING SALMONELLOSIS AS AN EXAMPLE

Kurtieva Sh.A.

Doctor of Medicine, Professor, Department of Functional Diagnostics, CRPCMR. Tel: +998 94 696 61 67

Gafurov B.G.

Head of the Department of Neurology, CRPCMR, Doctor of Medicine, Professor

Alikulova N.A.

Professor, Doctor of Medicine, Department of Neurology, CRPCMR

Abstract: Thanks to the work of a number of researchers, many mechanisms of the pathogenesis of intestinal infections in children have been deciphered to date. In particular, the participation of reflex and humoral factors of the vegetative part of the central nervous system with the development of vegetative-visceral dysfunctions in their pathogenesis has been indisputably proven [45, 91, 142, 144]. According to the theory of A.A. Koltypin, these dysfunctions have a phase character and, regardless of the etiology, are caused by the continuity in the functional activity of the leading mechanisms of vegetative support of the body: sympathoadrenal, parasympathetic and humoral.

Keywords: pathogenesis, phase characteristics, vegetative homeostasis, young children, severe forms of intestinal infections.

Comprehensive information on the assessment of the state of vegetative homeostasis in a sick child can be obtained only by comparing the results of clinical observations, biochemical and functional research methods. We did not find any publications containing information on such complex studies in children with intestinal infections, in particular, patients with salmonellosis. In this regard, we examined the state of vegetative homeostasis in 146 young children with salmonellosis. In this report, we present the results of the first part of the study, including the results of clinical and some instrumental indicators.

Based on the literature data, we compiled an original table of evaluation criteria for clinical and pathophysiological manifestations of the sympathetic and parasympathetic phases, which includes the main clinical criteria, a number of biochemical indicators, CIG and ECG data (Table 1).

Table 1

Evaluation criteria for clinical and pathophysiological manifestations of vegetative regulation in severe salmonellosis in young children

Clinical signs	phase	
	sympathoadrenal	parasympathetic

Central nervous system	Excitement, muscle hypertonia, convulsive readiness, tonic-clonic seizures are possible	Depression, lethargy, muscle hypotonia and hyporeflexia
Central hemodynamics	Tachycardia, sonorous heart tones, rapid pulse, tense, increased systolic and diastolic pressure	Normal or bradycardia (vagal heart phenomenon), pulse of medium filling and tension, decrease in systolic and diastolic pressure
Peripheral hemodynamics	Pale skin, cyanosis of the lips, hands, feet, positive Guedal's symptom, cold distal parts of the extremities, dry mucous membranes	The marbled pattern of the skin is pronounced, acrocyanosis, a sharply positive symptom of Gwedel, red dermographism
Body temperature	high	Subfebrile or normal, sometimes subnormal
hemostasis	Phase 1 of DIC syndrome – hypercoagulation, increase in prothrombin index and other hemostasis indicators	Phase II of DIC syndrome, hypercoagulation, decreased hemostasis
Water balance	The tendency to hypovolemia	The trend towards stabilization
Gastrointestinal tract	Tendency to develop intestinal atony, up to paresis	Decrease in stool, tendency to cramps of intestinal muscles, flatulence
kidneys	Oliguria, increased creatinine	Tendency to stabilization; decrease in creatinine
leukocytes	Leukocytosis, neutrophilosis-rod-shaped shift	Leukopenia, monocyte-lymphocyte shift
ESR	Increased	Within the normal range or reduced
Electrolytes	Hyponatremia, blood plasma potassium is normal or elevated	Depending on the therapy, there is a tendency to hypernatremia
Glucose content	Increased	Lowered
КИГ	Hypersympathicotonic variant of IVT	Vagotonic version of IVT
ECG, rhythm character	Sinus tachycardia	Sinus tachy or bradycardia, arrhythmia
Teeth P II, III	Increasing the amplitude	Amplitude reduction

PQ interval	Normal or shortened	Elongated, blockade of I,II degree
ST segment	Downward displacement from the isoline	Offset upward from the isoline
T wave VI, VII, V5	Flattened, 2-phase or negative	High, pointed, amplitude increase up to 50% of the norm

When analyzing the anamnestic and clinical laboratory parameters conducted in patients using these criteria, it was found that 74 (70.48%) children with gastrointestinal salmonellosis and 31 (75.60%) with generalized were admitted to the sympathoadrenal phase of the disease. 20 (19.05%) patients with the gastrointestinal form and 9 (21.95%) with the generalized form had signs of sympathetic effects of ANS upon admission, but at the same time there were signs of activation of parasympathetic reactions, which was regarded as a transitional phase. In the parasympathetic phase, 11 (10.47%) children with the gastrointestinal form of the disease and 13 (31.71%) with the generalized form were admitted. As can be seen from the above data, children with a generalized form of the disease were admitted mainly in the parasympathetic and transitional phases, which is probably due not only to later hospitalization, but also to the peculiarities of chronobiological parameters.

It is known that the sympathoadrenal phase can manifest itself from several minutes to several days, and the parasympathetic phase can manifest itself from several days to several weeks [65, 91]. The analysis of clinical data in our patients revealed that the sympathoadrenal phase lasted 1-3 days in the generalized form of salmonellosis and 3-5 days in the gastrointestinal form. The parasympathetic phase was longer. The temporal characteristics of the manifestations of the sympathoadrenal and parasympathetic phases in the examined patients are presented in Table 2.

Table 2

Temporal characteristics of manifestations of the sympathoadrenal and parasympathetic stress phases [day]

The phase of the disease	**The form of the disease**	
	генерализованная	гастроинтестинальная
Sympathoadrenal	2,09±0,04	3,33±0,31
Parasympathetic	17,90±1,5	13,05±0,85

The difference in the duration of the phases in these clinical forms of salmonella infection is explainable given the protective purpose of the body's autonomic reactions. It is known that the activation of the sympathoadrenal mechanisms of the autonomic nervous system is adaptive in nature and is aimed at protecting the body from the effects of various pathological agents, in this case, salmonella infection.

Like any protective reaction, it can become excessive and lead to serious clinical and pathogenetic disorders. The more the sympathetic division of the autonomic nervous system is activated (and the degree of its activation depends on both the massiveness of toxemia and the state of reactivity of the macroorganism), the faster it is depleted, the faster the parasympathetic phase sets in and the longer it lasts, which explains the higher frequency of admission to hospital in the transitional and parasympathetic phases of patients with a generalized form of salmonellosis. When analyzing the clinical symptoms, it was found that the main manifestations of the sympathoadrenal phase in the generalized form of salmonellosis were: hyperthermia, anxiety, convulsions, impaired consciousness, pale skin, moderate cyanosis, increased blood pressure, flatulence (tendency to intestinal atony), loose stools 3-5 times a day. At the same time, disturbances in the water-electrolyte balance corresponded to exsicosis of I - II degree, that is, toxicosis prevailed in the clinic of the generalized form of salmonellosis. The most pronounced biochemical indicators were reactive changes in the hemostasis system, characteristic of the first phase of DIC syndrome - the hypercoagulation phase. This was evidenced by the following indicators: prothrombin index - 108.5 + 3.1; plasma recalcification time - 98.1+6.25 sec, thrombotest - 6.3+1.18 units, blood fibrinogen A - 4.4+0.16 g/l. In addition, an increase in the concentration of low-density lipoproteins (LDL) was noted - 38.1+1.9 units, which apparently have an adaptive, protective nature, since LDL can act as sorbents of toxic products. The sympathoadrenal phase was also characterized by a tendency to increase the concentration of urea (10.3#0.5 mmol/l), blood glucose (6.8+0.44 mmol/l), hematocrit - 39.4+1.7, depletion of cells in potassium (in erythrocytes - 3.1+0.19 mmol/l, in blood plasma 82.1+3.12 mmol/l; and accumulation of sodium in them (respectively 157.7+7.8 mmol/l, and 19.6+1.3 mmol/l), which, apparently, was the result of disturbances in transmembrane transport processes. In the gastrointestinal form, there were frequent vomiting and loose stools up to 10-12 times or more with a clearly expressed syndrome of exsicosis of II and even II-III degree (thirst, decreased tissue turgor, sunken fontanelle, dry mucous membranes membranes, etc.). The stool is abundant, with an admixture of mucus, often blood, greenery like "swamp mud". Intestinal atony with the development of paresis in 6 (14.63%) was characteristic. Disturbances in water-electrolyte balance were more pronounced than in the generalized form of salmonellosis: hematocrit - 41.4 + 1.4, more pronounced depletion of cells in potassium (in erythrocytes 2.9-10.09 mmol / l, and in blood plasma 80.2 ‡ 3.14 mmol / l), an increase in the sodium content (respectively 159.6 + 7.9 and 20.8 + 1.4 mmol / l). Thus, the severity of clinical and pathophysiological manifestations of the sympathoadrenal phase quantitatively depended on the form of the disease, which was manifested by a more pronounced clinical manifestation in children with a generalized form, and less pronounced in patients with a gastrointestinal form. In addition, with a generalized variant in the sympathoadrenal phase, the characteristics of the state of the central and peripheral nervous system in 40 (98.2%) patients, hemostasis in 37 (90.24%), and leukocyte germ in 34 (82.92%) changed to a greater extent, and with a gastrointestinal form, gastrointestinal tract disorders were detected in the form of a change in the frequency and nature of stool in 105 (100%), atony, and bloating.

The second phase of the infectious and inflammatory process - parasympathetic - was characterized by distinct manifestations of vagotonic reactions. Arousal and muscle hypertension were replaced by lethargy, adynamia (extreme variant - depression, hyperreflexia, muscle hypotension), blood pressure decreased, heartbeat decreased, heart tones were muffled. Microcirculation disorders were manifested by marbling of the skin, their cyanosticity, red dermographism, increased sweating. Body temperature decreased to subfebrile and normal values, the extreme variant was subnormal temperature, which was observed in 4 (2.73%) children with an unfavorable outcome of the disease. The analysis of the clinical manifestations of the

parasympathetic phase of the vegetative response allowed us to establish the universality of the listed changes, independent of the form of salmonellosis.

The dynamics of clinical and clinical-biochemical parameters in the parasympathetic phase of the disease, despite the general trends in the course of the pathological process, indicated their ambiguity in relation to the outcomes of the disease. A number of manifestations of this phase of the infectious process may indicate both the subsiding of pathological phenomena with the transition to recovery, and the tendency of the process to a prolonged course or death. This course of the disease may be due to the fact that in children mainly of the 1st year of life with an unfavorable premorbid background, the parasympathetic phase may occur with active deposition of the pathogen in the structures of the reticuloendothelium and a violation of its elimination from the body. The deposition of salmonella in the reticuloendothelial system is inherently adaptive, but if the processes of destruction of the pathogen in it do not occur completely, then a breakthrough of bacterial flora into the blood is possible, with the development of secondary bacteremia, which, against the background of an exhausted adaptation reserve, can lead to a number of dysmetabolic disorders, the development of multiple organ failure and, ultimately, fatal exodus.

A number of symptoms in these [favorable and unfavorable] variants of the course of the parasympathetic phase of salmonellosis may coincide or differ qualitatively-

quantitatively. The differential diagnosis of the possible outcome of the parasympathetic phase of salmonellosis is presented in Table No. 3.

The favorable course of the parasympathetic phase with the outcome of recovery in patients was characterized by a uniform decrease in body temperature to subfebrile, and then normal [in 96 (91.42%) with gastrointestinal form and 36 (87.80%) with generalized). Symptoms of general intoxication decreased markedly, excitement was replaced by some depression, but not sharp, mainly in the form of lethargy [in 78 (74.28%) and 32 (78.04%, respectively)], sleep improved.

Persistent microcirculation disorders were manifested by cyanosis of the lips and nails [in 41 (39.05%) and 22 (53.65%)], cooling of the hands and feet [in 38 (36.19%) and 14 (34.14%)], a positive Gwedal symptom [y 18 (17.14%) and 9 (21.95%)], A marble skin pattern is possible. Tachycardia may persist [in 32 (30.48%) and 19 (46.34%)], or bradycardia [in 28 (26.67%) and 14 (34.15%)], muffling of heart tones [in 44 (41.90%) and 22 (53.65%)1, a tendency to decrease A/D [at 51 (48.57%) and 29 (70.73%).

Hemostasis was characterized by the transition of hypercoagulation to hypocoagulation with the appearance of nosebleeds [in 4 (3.81%) and 3 (7.32%)], with increased hemocolitis [in 27 (6.67%) and 19 (19.76%)], sometimes intestinal bleeding [in 2 (1.90%) and 1 (2.44%)].

Stools became less frequent up to 3-5 times with gastrointestinal and 2-3 times with generalized form with an admixture of mucus and greens. Vomiting may persist (in 18 (17.14%) and 9 (21.95%)], but is rare, more often single. There was a decrease in the size of the liver [in 68 (64.76%) and 21 (51.21%)] and the spleen [in 32 (30.48%) and 12 (29.27%)].

Leukoformula with a tendency to monocytosis [in 40 (34.09%) and 21 (51.22%)] and lymphocytosis [in 28 (26.67%) and 14 (34.15%)]. ESR decreases to normal (in 44 (41.90%) and 17 (41.46%)).

Changes in biochemical data were characterized by a decrease in indicators, in particular, in the generalized form, the prothrombin index was up to 80.6+2.7 mmol/l, the recalcification time was

up to 78.2+5.0 seconds, the fibrinogen A content was up to 1.91+0.09 g/l, in the gastrointestinal form 82.4+1.9 mmol/l, 79.9+4.2 s, 31.1+1.11, 2.0+0.08 g/l .

The tendency to stabilize water and mineral metabolism in the generalized form was manifested by a decrease in the potassium content in erythrocytes of 3.5+0.08 mmol/l and an increase in its plasma of 73.7+5.4, in gastrointestinal - 3.1+0.07 mmol/l and 70.1+4.8 mmol/l, respectively, a decrease in hematocrit of 30.6+1.2% and 31.1+1.11% accordingly.

There was also a decrease in the total protein content in the generalized form to 58.7+2.8 g/l, in the gastrointestinal form to 57.5+2.3 g/l, urea - 4.8+0.32 and 4.2+0.1 mmol/l, respectively, glucose - 4.4+0.12 mmol/l and 4.0+0.16 mmol/L.

ECG indicators were manifested in the form of sinus tachycardia in 19 (46.34%) and 32 (30.48%), respectively, normo- 8 (19.61%) and 45 (42.86%) and bradycardia 14 (34.15%) and 28 (26.67%), arrhythmias 22 (53.66%) and 44 (41.90%), a decrease in the amplitude of the P wave at 34 (82.92%) and 62 (59.04%), an increase in the PQ interval at 8 (19.51%) and 18 (17.14%), an offset of the ST interval above the isolines 8 (7.62%) and 6 (14.63%). Cardiointervalography has determined the transition of hypersympathicotonic vegetative reactivity to sympathicotonic..

Table 3

Differential diagnostic criteria for favorable and unfavorable course of the parasympathetic phase of salmonellosis

The analyzed signs	The parasympathetic phase with an outcome in recovery	The parasympathetic phase with the risk of death, development of complications and prolonged course
The central nervous system	Lethargy, adynamia, followed by increased activity, sometimes short-term periodic arousal	Depression, consciousness may be impaired, adynamia, masked face, tendon reflexes increased, abdominal decreased, nystagmus
Central hemodynamics	Normal or bradycardia, medium-filling pulse, muffled heart tones, decreased blood pressure	Tachy- or bradycardia, heart tones are deaf, expansion of the boundaries of the heart, a significant decrease in arterial and pulse pressure
Peripheral hemodynamics	Reduction of peripheral vascular spasm, possible marbled skin pattern, cyanosis of the hands, feet, their cooling	Total relaxation of blood vessels, diffuse cyanosis of the skin in combination with a waxy or gray-earthy skin tone, cold hands and feet.
Body temperature	Normal or subfebrile	Subfebrility with possible candles up to 400 or hypothermia

Hemostasis	Phase II of DIC syndrome, hypercoagulation	Phase II-III of DIC syndrome,
Водно-минеральный обмен	Тенденция к стабилизации	The development of hypovolemia, a decrease in the volume of circulating blood, high hematocrit
ЖКТ	The stool is scanty, with an admixture of mucus and greenery, the appearance of an admixture of blood	Flatulence, spastic constipation, poor stools, with mucus and blood, intestinal bleeding is possible
Very	Not enlarged	Steadily increased
The spleen	Not enlarged	Splenomegaly
Kidneys	Oliguria	Tendency to anuria
The leukoformula	Tendency to lymphocytosis and monocytosis	Rod-shaped shift of the leukoformula, leukopenia
SOE	Within the normal range	Slowed down
ECG	Sinus bradycardia	Tachyarrhythmia or bradyarrhythmia, rhythm and conduction disorders, low-voltage curve
KIG	Hypersympathicotonic BP with transition to sympathicotonic	The asymptoticotonic variant of BP

As an example, we present the following observation of the favorable development of the parasympathetic phase of salmonellosis.

Patient Mamura; 3.5 months old (ist. bol. No.1910; 2015), from the third pregnancy, was born at term with a body weight of 3,800 g, with asphyxia, mixed feeding. She was admitted to the clinic on the second day of her illness.

From the anamnesis: the disease began acutely, with an increase in temperature to 40 ° C, which periodically decreased to 38-39 ° C. There was anxiety, breast rejection, regurgitation, loose stools with mucus and greens up to 10 times a day. I received antipyretics at home. The mother had intestinal dysfunction a week before the child's illness, was not treated, was not examined.

Upon admission, the general condition is very severe, agitated, convulsive readiness, temperature 39.5 ° C, pale dry skin, hot to the touch, turgor and elasticity of tissues are somewhat reduced, visible mucous membranes are dry, the voice is sonorous. The large fontanel is sunken, breathing is frequent, shallow, 65 times a minute, hard breathing in the lungs.

Pulse is 180 per minute, average filling and tension, heart tones are clear, blood pressure is increased to 100/60 mmHg. Lips are bright, tongue is dry, overlaid with a white coating, there are aphthae on the mucous membrane of the cheeks.

The abdomen is swollen, sensitive to palpation, the liver protrudes from under the edge of the costal arch by 3×3.5×4.0 cm, of a mildly elastic consistency, the surface is smooth. The spleen protrudes from under the edge of the costal arch by 1.5 cm, soft-elastic. The sigmoid colon is not palpable, the anus is closed, the stool is liquid with an admixture of greenery, mucus, abundant, up to 7 times a day. The diuresis is reduced.

Prothrombin index 98.6, thrombotest - V, plasma recalcification time - 96 s, fibrinogen A - 4.95 mmol/l, hematocrit - 35.7, total protein - 62.86 g/l, B-lipoproteins 36.4 units, blood glucose - 6.7 mmol/l, urea - 12.0 mmol/l, potassium - in erythrocytes 3,861 mmol/l, and in blood plasma 80.83 mmol/l, sodium - 159.3 mmol/l, and 18.72 mmol/l, respectively.

Coproscopy: liquid feces, green color, mucus +++, leukocytes in mucus up to 20 in the field of view, detritus, starch in large quantities. The growth of Salmonella typhimurium was detected in the blood culture.

ECG - sinus tachycardia, ST shifted downward from the isoline in V5.6 (ST offset downward from the isoline), T I,II, V5.6 - low amplitude.

KIG hypersympathicotonic vegetative reactivity,

On the 4th day of the disease, the temperature is subfebrile with a periodic short-term increase to 38 ° C. The skin is marbled, pale, the child is sluggish, adynamic, cyanosis of the lips, nails. The distal parts of the extremities are cold. A positive symptom of Gwedal. Bradycardia is 70 per minute. The pulse is of medium filling and tension. Blood pressure has decreased to normal. The stool became less frequent - 3-5 times a day, meager, with an admixture of mucus and greenery and streaks of blood. Cyanosis of the lips and nails. Diuresis corresponds to the liquid consumed. The number of white blood cells is below normal, ESR is slowed down.

Clinical diagnosis: salmonellosis, severe generalized form (S.typhimurium hemoculture), with a predominance of toxicosis, grade I-II exicosis, gastroenterocolitis, stomatitis.

Concomitant diseases: rickets I - initial stage.

On the 7th day of hospitalization, the child is sluggish, adynamic, the temperature is subfebrile, the skin is pale, with a cyanotic tinge, cyanosis of the lips and nails. The distal parts of the extremities are cold, a weakly positive symptom of Gwedal. Bradycardia - 70 per minute, pulse of medium filling and tension. The stool became less frequent - 3-5 times a day, meager, with an admixture of mucus, greens and blood, the liver decreased to 1+1,5+1,5 cm from under the ribs, spleen - up to 1.5 cm. Diuresis corresponds to the fluid consumed. Prothrombin index - 89%, hematocrit - 25.7, thrombotest - IV degree, plasma recalcification time - 75 s, fibrinogen A - 2.70 mmol/l, total protein - 50.0 g/l, B-lipoproteins - 16 units, blood glucose - 5.02 mmol/l, urea - 7.2 mmol/l, potassium in erythrocytes is 3.3 mmol/l, and blood plasma is 77.1 mmol/l, sodium is 146.2 and 19.4 mmol/l, respectively.

ECG - sinus bradycardia.

KIG - BP is sympathicotonic.

During the therapy, the child's condition gradually improved and by the 16th day he was discharged from the hospital under the supervision of a district doctor.

Thus, the generalized form of salmonellosis developed in a weakened infant, had a severe course with a clear phase in the development of autonomic dysfunctions. The condition at admission

reflected the clinic of the sympathoadrenal phase, after which a parasympathetic (approximately day 7) phase gradually formed through the transitional phase, which took a favorable course with an outcome in recovery.

Further analysis of the phase structure of clinical and pathological manifestations of salmonellosis showed that it is clearly related to chronobiological features, namely: patterns of about three-day rhythms.

In particular, the child experiences a critical period, as a rule, within the first 3 days, subsequently, a transitional phase takes place within the framework of a about-week rhythm, and finally, within the framework of a about-nine-day rhythm, the processes of stabilization and relief of infectious toxicosis are more clearly formed. In general, the sympathoadrenal phase can be discussed in the first 3 days, the next three days are characterized as a transitional period and, finally, the third about three-day rhythm forms an exit to the parasympathetic phase with the restoration of normal functions, provided that the course of the disease is favorable.

An unfavorable variant of the course of the parasympathetic phase can be assessed as the transition of the sub/compensated phase to decompensation, In such cases all the previously listed symptoms take on a pronounced character with the development of complete paralysis of vegetative functions both sympathoadrenal and parasympathetic. Clinical manifestations are a decrease in temperature to subnormal, an increase in skin cyanosis, cyanotic spots on the back, cold limbs, a sharp violation of central blood flow - a decrease in blood pressure, dull heart tones, pronounced shortness of breath, congestive wheezing in the lungs, oligoanuria. Blood clotting factors are significantly altered, manifested by hypocoagulation, which can lead to consumption coagulopathy. This is the decompensated phase of shock. Such a picture can develop both in generalized (with more pronounced intoxication and redistribution of blood) and in the gastrointestinal form with the development of hypovolemia. These symptoms were observed in 5 fatal cases.

As an example of an unfavorable course of the parasympathetic phase, we present the following observation:

Patient Atabek 6 months old (ist. bol. No. 1867 2014), was admitted to the children's infectious diseases hospital on the 2nd day of illness.

From anamnesis: born on time, with asphyxia, with a body weight of 2,400 kg, artificial feeding from the age of one month. Frequent colds, single seizures against a background of high fever.

The disease began acutely, with an increase in temperature to 38.5-39 ° C, became restless, tearful, refused food. After 10 hours, loose stools with an admixture of mucus appeared.

The condition progressively worsened during the day. The temperature was high, despite taking antipyretics.

Upon admission to the hospital, the condition is severe, the temperature is 39.2 °C, consciousness is preserved, anxiety, convulsive readiness, skin is hot, dry, cyanosis of nails, lips, nasolabial triangle, a positive symptom of Gwedal, skin turgor is reduced, pulse is frequent, up to 200 per minute, heart tones are sonorous, breathing is frequent - 64 per minute, It's superficial. There is rough-hard breathing in the lungs, the tongue is dry, overlaid with a white coating, rumbling can be heard from a distance, palpation is painful. Liver +2,0+3,5+4,0 see, the surface is smooth. The spleen protrudes from the hypochondrium by 2 cm.

In coprology, leukocytes up to 15-20 in the field of view, in the urogram - protein 0.033%. The growth of Salmonella tiphy murium was noted during the BAC/culture of blood and urine.

Post-syndrome intensive therapy was performed. Despite this, the child's condition remained very severe, on the 3rd day of the illness the child became very sluggish, inhibited, the gaze was periodically fixed at one point, convulsions of the type "paralysis of the gaze". Body temperature dropped to 37.5 °C. The heart tones have become deaf, tachycardia, replaced by tachyarrhythmia, cannot be counted. Blood pressure is low - 60/30 mmHg. The skin became marbled, then acrocyanosis appeared, the distal parts of the extremities were cold, a sharply positive symptom of Gwedal. The stool is rare, and there is an abundant admixture of blood in it. The urine is cloudy, the color of meat slops. Within a few hours, the child's condition progressively worsened, the temperature dropped to subnormal (35.6 ° C), consciousness was absent, tonic seizures periodically, the skin was gray with an earthy tinge, hypostatic spots on the back. Stool with a lot of blood, repeated vomiting of coffee grounds, then bleeding from injection sites appeared.

Laboratory tests - leukopenia, ESR is slowed down, fibrinogen A is sharply reduced in the coagulogram - 0.88 g/l. The child's condition continued to deteriorate, multiple organ failure developed and, against the background of increasing heart and respiratory failure, the child died on the 4th day from the onset of the disease.

Diagnosis:

salmonellosis, severe generalized form, s.tiphumurium, (hemo- and urine culture), with predominance of toxicosis, exicosis.

Complications: infectious and toxic shock III, DIC syndrome

stage III; cardiovascular insufficiency PI-SHI, respiratory insufficiency II degree.

Thus, during salmonellosis, this child clearly had a sympathoadrenal phase of 2.5 days, after which a parasympathetic phase developed on the 3rd day with an unfavorable outcome of the disease.

Summarizing the above, we note that the differentiation of symptoms of the parasympathetic phase of salmonellosis, depending on their prognostic significance, contributes to the identification of a group of patients at risk of death or prolonged course of salmonella infection. Such patients should receive the most active therapy with timely transfer of children with a possible risk of adverse course to the intensive care unit and intensive care unit, followed by follow-up after discharge from the hospital, since this category of children has profound metabolic disorders, the recovery of which is extremely slow, and children are prone to frequent diseases with intercurrent infections.

The data of clinical observations on the phase of the vegetative response to infectious stress were confirmed by the results of cardiointervalographic studies, which showed that among children admitted with the gastrointestinal form of salmonellosis, on the first day of hospitalization, patients with sympathicotonic initial vegetative tone (IVT) were 75 (71.43%), vagotonic IVT - 13 (12.38%), initial eitonia -17 (16.19%), and in the group of patients with generalized infection on the first day of hospital stay, there were 20 children with initial sympathicotonia (48.18%), with initial hypertension - 8 (19.51%), initial vagotonia - 13 (31.71%). Both among patients with the gastrointestinal form of salmonellosis and among patients with generalized, children with sympathicotonic IVT prevailed, but among patients with the gastrointestinal form, the frequency of detection of initial sympathicotonia was higher (in 71.43%) than among children with

generalized form (in 48.18%). This was associated with a higher detection rate in patients with generalized parasympathetic IVT (in 31.71%) than in children with gastrointestinal form (10.47%).

Thus, the predominance of initial sympathicotonia in all examined patients indicated the presence of activation of sympathoadrenal compensatory mechanisms in them, and the presence of a higher frequency of initial vagotonia in patients with generalized salmonellosis indicated the depletion of compensatory and adaptive mechanisms of the autonomic nervous system in them. The presence of hypertension in a small proportion of patients did not indicate the absence of a reaction of the autonomic nervous system to salmonella infection. When analyzing the clinical symptoms in these patients, simultaneous activity of both the sympathetic and parasympathetic departments of the ANS was noted (these were mainly patients admitted in the transitional phase of the disease), which led to the detection of hypertension on the cardiointervalogram.

This fact emphasizes the need to take into account, first of all, clinical symptoms when assessing the vegetative status, and only as additional data from functional research methods, including cardiointervalography.

The results of CTG performed on the 7th day of hospitalization in patients of both groups indicated a pronounced predominance of parasympathetic vegetative reactions, which coincided with clinical data. 83.81% of children with vagotonic IVT were among patients with gastrointestinal salmonellosis, 85.37% among patients with generalized form. The rest of the children were diagnosed with hypertension. There were practically no patients with sympathicotonic IVT. Thus, the vast majority of the examined patients on the 7th day of the disease were in the parasympathetic stage of the disease.

It should be noted that in addition to differential diagnostic clinical signs of an unfavorable course of the parasympathetic phase of salmonellosis, cardiointervalography data can be used to predict its outcome. Indicators of vegetative reactivity have the greatest prognostic value, especially in combination with information about the initial vegetative tone. Cardiointervalographic studies conducted on the 1st and 7th days of hospitalization in the orthostasis position, with the calculation of the IN2/IN1 coefficient and determination of the nature of BP showed that when patients with both gastrointestinal and generalized forms of the disease were admitted, asymptoticotonic vegetative reactivity prevailed - 36.19% and 46.34%, respectively (Fig. 2). On the 7th day, the detection rate of asymptoticotonic BP increased and was 74.29% and 85.37%, respectively, and among children with generalized salmonellosis, there were no patients with hypersympathicotonic BP. Among children with gastrointestinal form, they accounted for only 2.86%.

Thus, in the parasympathetic phase, the depletion of compensatory sympathoadrenal mechanisms was established. The IN2/IN1 coefficient can be considered an indicator of the depth of their depletion

Our observations indicate that a decrease in this coefficient below 0.66 in the presence of initial vagotonia and asymptaticotonic BP makes it possible to predict the prolonged course of salmonella infection and a high risk of death.

The data of the analysis of individual cardiointervalography indicators were confirmed by the results of the analysis of the average group indicators (Table 3).

Almost all indicators of CIG in the examined patients were significantly changed compared to those in healthy patients. Studies conducted on the 1st day of hospitalization (in the sympathoadrenal phase) revealed a significant decrease in Mo in the clinoposition, more pronounced in patients with generalized salmonellosis, which indicated a greater tension in their adaptive sympathoadrenal mechanisms. When loaded with orthostasis, Mo decreased even more, however, in patients with a generalized form, this decrease was insignificant, which indicated the depletion of the reserve adaptive capabilities of the sympathetic department of the ANS.

A different picture was observed on the 7th day of hospitalization, when patients were in the parasympathetic phase. Mo in the clinoposition significantly increased in patients with both forms of salmonella infection, which indicated an increase in parasympathetic effects on the initial vegetative tone. The dynamics of Mo indicators after orthostasis loading in the parasympathetic phase was similar to that in the sympathoadrenal phase, that is, there was a pronounced activation of sympathoadrenal mechanisms in ensuring vegetative reactivity of patients with gastrointestinal form (which corresponded to Wilder's law: the lower the initial activity of the physiological state, the greater its relative change when exposed to irritating factors).

In the generalized form, the decrease in Mo after orthostasis loading was significantly less pronounced, which indicated the depletion of sympathoadrenal.

Table 4

KIH indicators in children with salmonellosis, depending on the form and phase of the disease

Timing and position during examination		Analyzed indicators				
		Mo, c	Amo %	Δx, c	ИН y.e.	$ИН_2/ИН_1$
1-e day	Clinostasis	0,40±0,05* 0,30±0,05**	46,62±2,56*** 54,50±2,46***	0,10±0,02* 0,12±0,02*	591,1±38,16*** 708,7±41,27***	1,71±0,08*** 1,32±0,09
	Orthostasis	0,33±0,02** 0,32±0,04*	60,08±3,11*** 50,61±2,73***	0,09±0,03* 0,09±0,01**	1013,7±59,21*** 935,2±52,61***	
7-e day	Clinostasis	0,75±0,05** 0,98±0,14*	23,62±1,14* 35,76±1,71*	0,40±0,05* 0,29±0,07	40,8±5,81*** 63,1±7,04***	1,45±0,06 0,86±0,04***
	Orthostasis	0,37±0,04* 0,81±0,07**	21,34±1,56*** 23,04±1,04***	0,37±0,03* 0,26±0,06	77,9±6,24*** 54,3±6,22	
	Healthy (K/O)	0,61±0,08 0,57±0,09	20,09±2,39 32,3±2,53	0,24±0,06 0,21±0,05	130,9±24,17 184,4±25,12	1,41±0,03

Note: the numerator shows data from patients with the gastrointestinal form, the denominator shows data from the generalized form. Asterisks indicate the reliability of differences in indicators compared to data from healthy children; one - $p<0.05$; two - $p<0.01$; three - $p<0.001$.

mechanisms of vegetative support of reactivity of the organism of these patients. Similar changes were noted in other indices of the CIG - AMo, Δx. The tension index increased reliably in the examined patients in the sympathoadrenal phase and decreased in the parasympathetic phase. The coefficients IN2/IN1, reflecting the state of vegetative reactivity, confirmed the tendency to increase of asympathicotonic VR in the parasympathetic phase in patients with the gastrointestinal form and the obvious predominance of this type of VR in the parasympathetic phase in patients with the generalized form of salmonellosis. and

Thus, cardiointervalographic studies confirmed the phasic nature of the course of severe forms of salmonellosis in children, revealed on the basis of clinical data. Increased activation of protective and adaptive sympathoadrenal mechanisms of vegetative support in the sympathoadrenal phase according to the CIG data led to their exhaustion and development of the parasympathetic phase of the disease, in which the activity of the parasympathetic division of the ANS prevailed. The obtained data indicate the need for drug correction of pronounced vegetative disorders in children with salmonellosis, taking into account the phased nature of the course of this infection under the control of cardiointervalographic studies.

REFERENCES:

1. Делягин В.М. Вегетативная нервная система и ее нарушения. Эффективная фармакотерапия. 2024; 20(17): 22-28 с
2. Акалаев Р. Н., Арипходжаева Ф.А., Манколь В.Ю. Неврологические проявления интоксикационного синдрома при острых диареях инфекционной этиологии. Актуальные проблемы гигиены, токсикологии, эпидемиологии и инфекционных заболеваний в Республике Узбекистан. Материалы XII съезда гигиенистов, санитарных врачей, эпидемиологов и инфекционистов Республики Узбекистан. 2022. С. 222.
3. Баевский Р.М., Кирилов С.И., Климкин С.Н. Математический анализ изменений сердечного ритма при стрессе. - М., 1984.
4. Бегайдарова Р.Х. Функциональное состояние симпатико-адреналиновой системы у детей, больных сальмонеллезом: Автореф. дис канд. мед. наук. -Т., 2018. 17 с.
5. Вегетативные дисфункции у детей, с заболеваниями органов пишеварения. Козлова Л.В., Яйленко А.А., Пашинская Н.Б. с соавт. Материалы VI конгресса педиатров России. «Неотложные состояния у детей». - М., 6-9 февраля 2000. С. 190.