

## A CLINICAL ANALYSIS OF FOUR ALIMENTARY EPIDEMICS CAUSED BY SALMONELLA TYPHI MURIUM

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Alimentary toxico-infections are an important medical problem for the city of Varna and its district. Regretfully, despite prophylactic measures, the number of the cases shows no tendency toward a decrease. On the contrary, if conclusions are to be drawn from the case histories of the Clinic of Infectious Diseases in Varna, facts are just the opposite. Thus, the number of patients admitted to hospital with the diagnosis of Toxiinfectio alimentaris in 1961 amounts to 92, in 1962 — to 104, and during the first ten months of 1963 — to 94 cases. In fact, the number of individuals affected by alimentary infections is much higher in comparison with the number of hospitalized patients, since milder cases are submitted to domestic treatment. The least severe cases even escape medical registration. Sometimes the total number of patients with alimentary toxico-infections may be ten times as high as that of the hospitalized cases. For example, during the mass Salmonella outbreak in the village of B. and its surrounding villages in Varna district out of the 316 registered cases only 31 were admitted to hospital.

Representatives of the group of salmonellae, staphylococci, shigella Flexner (6), etc., were incriminated as etiologic agents in the observed alimentary toxico-infections. Salmonellae and particularly *S. typhi murium* were most commonly isolated. The rise in morbidity rates of salmonellosis is observed also abroad with special reference to the last 10—15 years. According to A. F. Bilibin (1962) (2' 9) dysentery being excluded, salmonella infections comprise 60% of the intestinal infections. Ju. Mirovski and Ja. Ondrachek (CSSR — 1958) (9) assume that 1/3 of all gastro-intestinal disorders are due to salmonellae.

An attempt will be made to give a brief analysis of several of the last epidemics in our district, caused by *S. typhi murium*, since they are of a considerable epidemiologic, clinico-diagnostic and social interest.

In September 1963, all the seven members of a family in the town of P., several hours following the ingestion of chicken meal, display symptoms of gastroenteritis. The food has been kept in a cellar in which mouse excrements were found. The house of that family was invaded by mice and rats. During the epidemiologic inquiry 37 baits were eaten by rodents. *S. typhi murium* was isolated microorganism from food residues. The same microorganism was also recovered from stools of the patients. All of them were hospitalized in the internal and later in the infectious wards (Head Dr. Batalski) of the Town Hospital in P. One of them was later transferred to the Clinic for Infectious Diseases in Varna. Clinically this outbreak was characterized by a malignant course and a variety of signs and symptoms. The disorder was limited within gastro-intestinal symptomatology only in three patients. In the remaining the clinical picture was aggravated with complications involving also other organs and systems. In the oldest members of this family (aged 84 and 86 resp.) the symptoms were particularly

severe, intoxication and cardiovascular insufficiency being predominant. The oldest died on the second day following the onset of the disease, his wife — on the 14th day. A severe course of the disorder was also observed in the youngest member of the family — a girl aged 4 — M.B.V. case history No. 3808/1963. From its record on the 4th day: ... severe general condition; accelerated arrhythmic pulse with extra systoles; muffled heart sounds; ECG data for myocardial impairment.

Several days later a slight systolic murmur appeared. The child improved slowly and was discharged from hospital in a good condition after 40 days stay in hospital.

The grandfather, I.R.I., aged 60, case history No 1953/63, following subsidence of the symptoms of toxemia (tormenting nausea and vomiting, incessant hiccup, hyperthermia, diarrhoea, dehydration) displayed the picture of toxic transversal myelitis with basic symptoms *retentio urinae et alvi*. The patient was transferred to our clinic. It was not before the end of the first month after the onset of the disorder that spontaneous miction was resumed and this led to the removal of the permanent catheter. On the 10th day the same patient had a severe and continuous epistaxis, necessitating nasal tamponade. Such epistaxis was present also in his wife, and she was also tamponaded. This symptom, observed in both patients, is of clinical interest, because haemorrhagic symptoms, aside of those originating in the gastro-intestinal tract, are rarely observed in salmonellosis.

Recently we observed a very severe and a generalized haemorrhagic syndrome in a child suffering from salmonellosis. This case was interesting also from epidemiological standpoint — it was a sporadic clinical case of a proved *Salmonella typhi* murium infection. An impression exists that sporadic cases of salmonellosis have become more frequent in this country. This is also pointed out by a number of foreign authors. According to some of them sporadic cases even outnumber the epidemic ones <sup>2, 9, 10</sup>. According to data of Covac (cited after A. F. Bilibin <sup>9</sup>) among 8901 cases of salmonellosis 81% have been sporadic.

Our clinical practice includes also the following tragic medical accident in a family from the village of K.R. in V. district, whose members suddenly fell ill on June 26th, 1962. Typical and severe local and general signs of alimentary intoxication were displayed at the very beginning by the mother, the son and the daughter. For that reason they were immediately hospitalized. The father G.G., aged 51, case history No. 1248/1962, was admitted to the Clinic two days after the onset of the disorder, because he considered himself slightly ill and believed he would go through the illness without lying in bed. On admission he displayed milder constitutional symptoms as compared with the other members of his family. Two days later his condition suddenly became worse. A fatal outcome occurred shortly with symptoms of acute heart failure. Patho-anatomical diagnosis: acute catarrhal gastroenterocolitis; marked dystrophy of all parenchymal organs. *S. typhi* murium organisms were isolated from the stools, the blood, the gall bladder and the contents of the small intestines. The same bacterial flora was isolated also from the domestically prepared cheese, found in the home of the affected family.

This case sustains our conviction that even the slightest cases of alimentary toxico-infections should be hospitalized on time or at least should be observed and carefully treated under a strict domestic regimen in bed. Caution is required when opinions on the prognosis are voiced. It seems that the old clinical rule that the prognosis of an alimentary toxico-infection depends on the degree of primary intoxication and infection and that the fate of the patient is already obvious during the first 24—48 hours, sometimes should be altered.

A year later the remaining living members of the aforementioned family gave a commemoration on the anniversary of the father's death and all of them (mother, son and daughter) again fell victims of *Salmonella typhi* murium, which was isolated from their stools. Fortunately, this time the disorder followed a mild course only with gastroenteric signs and febrile condition, and they were discharged from hospital in good health. One day before the onset of the disease the family ate

chicken meat which the night before had been left hanging under the eaves in the cold. No remnants were found from the meat but it could easily be imagined that it had been infected by rodents which were numerous in that house.

The next outbreak, which we are going to mention, is characterized by the mass of individuals involved. Nevertheless it has a milder and a more monotonous clinical picture:

Toward the end of August, 1963, in the villages B., P., G. and D. in V. district a mass alimentary toxico-infection occurred after consumption of locally prepared jerked beef, which has been prepared from meat preserved in a refrigerator. The meat displayed organoleptic data for decay — it had a slightly rotten sniff. In the following days jerked beef appeared on the market of the above-mentioned villages. The first cases of the disease are recorded in the 6th hour after the consumption of the meat and a mass epidemics is observed on the following day. In individual patients the incubational period amounted to 48 hours. The cases were particularly numerous. In the out-patient record book of the local Public Health Service are recorded 316 cases with the diagnosis of *Toxico-infectio alimentaris*. The clinical picture of the observed cases was manifested with an acute onset, fever, febrility — often up to 40°C, lassitude, drowsiness, disposition toward collapse, diffuse abdominal pains, continuous vomiting, repeated and voluminous watery bowels, sometimes mixed with mucus and blood. Objectively in most of the hospitalized more serious cases severe constitutional symptoms are present: febrility, pale skin, dried tongue, marked palpatory sensitivity over the entire abdomen, muffled cardiac sounds, tachycardia, hypotonia. Several days later their condition began to improve and all of them were discharged in good repair. Hospitalization was a little more continuous for the patient K. S. K., aged 68, case history No 2614/1963, who in addition to clinical symptoms of alimentary toxico-infection on the third day after admission, developed mild jaundice and displayed laboratory data for a slight hepatic injury. Despite the additional anamnestic and epidemiologic studies and paraclinical examinations the problem whether this mild form of hepatitis was also due to *Salmonella* infection remained unsolved.

*S.typhi murium* was isolated from the stools and the vomited materia. The same *Salmonella* organism was recovered from the jerked meat, in association with *Proteus vulgaris*.

The last epidemics, which is the subject of our present report outbreaked in a Kindergarten in V. In the afternoon of October 7th, 1963, the children were given cake with a filling of egg cream, which had been prepared at 11 o'clock in the morning. Out of 54 children 42 fell severely ill. Clinical signs were also observed in the personnel, who consumed the same cake. Two of the children vomited on the second hour following the snack, while in the remaining marked symptoms of the disorder appeared after the 4th hour. In the adults the incubation period varied between 1 and 3 days. Sixteen children and 7 adults from the personnel were hospitalized in the Clinic. The children displayed severe general disturbances in addition to symptoms of acute gastroenteritis. All this led to the formation of a toxemic syndrome, and in the following days —

also of exsiccosis. The children are flabby, with a grayish colour of the skin, encircled eyes, cold extremities and appear severely ill. The abdomen of most of them is distended. The stools are foul, watery, with an admixture of greenish mucus — resembling a marsh clay-slime. When specific, pathogenic and symptomatic therapy was started, the condition even in children severely ill improved. Several days later it became once again worse, due to the occurrence of toxic myocarditis. We consider the following two cases particularly indicative:

L. S., aged 5, from V., case history No 2038/1963. On October 9th (the third day after the onset of the disease) the child is markedly intoxicated with accelerated cardiac activity, with slightly enlarged heart — 2 cm to the left of the medioclavicular line, with muffled heart sounds, and no additional murmurs; the liver is 4 cm below the costal margin; ECG — hypoxemia of the myocardium. On October 15th the general condition of the child is slightly improved, the heart is within the same limits, on the apex a tender systolic murmur is audible, without propagation towards the axilla, the lower edge of the liver is 6 cm below the costal margin; ECG — the same findings. The child was discharged from hospital on November 5th with a considerable clinical improvement and a persisting slight blowing murmur on the cardiac apex.

2. M. G., aged 3 $\frac{1}{2}$  years, from the city of V. After the initial signs of gastroenteritis the condition of the child became worse toward the third day, when fever appeared again, the child slackened, started to vomit and complained of abdominal pains. Its cardiac activity was accelerated and remained irregular — to each 5—6 normal heart beats one extrasistole was recorded, the cardiac sounds were muffled and weak, on the apex a tender systolic murmur was audible. Slight perioral cyanosis. The liver was palpated 5 cm below the costal margin. ECG — data for myocarditis. A week later the heart sounds became more distinct and stronger, but the systolic murmur became louder and coarser without propagation. On the 25th day from the onset of the disease the child was cheerful, afebrile, with slightly accelerated cardiac activity and slight hepatomegaly (1 sm); the cardiac murmur retained its character.

As far as we dispose of exact information, another three children from the same epidemics, treated in another hospital, displayed similar signs of myocardial impairment.

The course of the infection was milder in the adult members of the personnel of the Kindergarten — only with signs of gastroenteritis.

Only in patient G. J. L., aged 34 years, from the town of V., case history No 2052/1963, salmonellosis acquired cholera-like course: incessant vomiting and diarrhoea, severe intoxication and exsiccation, loss of consciousness (faint).

Blood examination revealed at the onset of the disease normocytosis and slight leucocytosis, with a marked shift to the left, an eosinophilia and lymphopenia. Our data do not coincide with those of L. Russev<sup>11</sup>. As regards lymphocyte count — in a mass salmonellosis outbreak he observed lymphocytosis. The hemoglobin of the children decreased, particularly at the second examination. ESR was elevated in all cases.

The coproculture was positive for *S. Typhi murium* in 32 of all ill children. The same infectious agent was isolated also from the dirt of the cardboard holder of the eggs used in the preparation of the cake. Before breaking the eggs they were neither washed nor placed in a chloramine solution, according to orders for manipulation with eggs in public restaurants. The cake itself could not be examined bacteriologically, as no test specimen had been left.

### Conclusion

The salmonellosis problem is set forth with its entire significance. It imposes a series of important problems before the country physicians and the clinicists from the infectious, pediatric and internal hospital departments: early and prompt diagnosis, rational differential diagnosis (particularly in sporadic cases), the clinical polymorphism of the infection being taken into consideration, also energetic specific treatment, measures against the complications and infection-carriers, etc. No lesser responsibility is required from the remaining specialists in the control of salmonellosis: bacteriologists, epidemiologists, hygienists, medical officers, and medical propaganda organizers, veterinary doctors, etc. Our Public Health role is particularly stressed upon recently in connection with the spread of Public Feeding. The fact that medical workers in Varna and its surroundings are employed in the area of a national resort who displays the ambition to become a representative international resort center, obliges medical workers even more and attaches to their task in the control of salmonellosis a national and even international importance.

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### КЛИНИЧЕСКИЙ РАЗБОР ЧЕТЫРЕХ ПИЩЕВЫХ ЭПИДЕМИИ, ВЫЗВАННЫХ SALMONELLA TYPHI MURIUM

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### РЕЗЮМЕ

Число леченных в инфекционной клинике в Варне больных пищевыми токсинфекциями в течение последних лет показывает увеличение. Наряду с увеличением числа спорадических случаев салмонеллезов, увеличиваются также клинически тяжелые, атипичные и осложненные случаи этих инфекций. В настоящей работе делается разбор четырех

эпидемий, вызванных консуммацией, зараженной *Salmonella typhi* m-  
gum. Одна из них охватывает 316 заболевших. Заостряется внимание  
на более редких случаях среди некоторых из наблюдаемых заболеваний  
(поражения миокарда с формированием систолического шума, попе-  
речный миелит, геморрагические явления, переходные поражения пече-  
ни и др.).

Даны и соответствующие эпидемиологические данные.