

**STUDY ON THE DYSENTERY EPIDEMIC, CAUSED  
BY BACTERIUM DYSENTERIAE SONNE WITH CONCOMITANT  
DEVELOPMENT OF CATARRHAL INFLAMMATION OF UPPER  
RESPIRATORY WAYS (CURW) IN A CLOSED CHILDREN'S  
COMMUNITY**

K. Kuzmov, P. Panayotov, V. Zozikov, P. Kokosharov, G. Kaprelian,  
N. Dakov, M. Radkov and S. Nikolova

Dysentery epidemics, caused by *Bact. dysenteriae* Sonne have been described rather often in the past decade, especially among children groups (1, 3, 5, 6, 7). More rarely a combined course of the dysentery epidemic is reported with epidemic caused by adenovira or other etiological factors (7). In this country, *Sheljazkov* and *Radev* (2), *Stanishev*, *Nedialkova* and *Belova* (4) have observed clinical angina in patients with dysentery. In the literature reviewed we couldn't find evidence for simultaneous development of dysentery epidemic — Sonne and catarrhal inflammation of the upper respiratory ways (CURW). The latter combination was observed in the boarding school of the village G. near Varna.

The first dysentery cases occurred on 3 February, 1964 and spread rapidly, reaching the peak on 11 February; the illness was controlled on 15 February. The cases with CURW almost coincide with the dynamics just described (diagram 1).

Information concerning dysentery disease and CURW show (table 1 and diagram 1) that CURW morbidity rate is higher than that of dysentery. In part of the patients a combination was disclosed of the two affections (diagram 2). The analysis of the widespreading of the illnesses according to classes, sex and dormitories enabled us of establishing the following characteristic features:

Boys and girls of the lower classes are involved in a greater degree by dysentery affections and less by CURW. The contrary is valid for the children of the upper classes. The morbidity rate of dysentery among girls is higher as compared to boys, whereas morbidity of CURW — higher among boys and lower among girls (see diagr. 3 and 4).

The involvement of children by dysentery and CURW according to dormitories is reverse. For instance, in II dormitory where girls live mainly of III and IV classes, the dysentery cases are 60% and CURW — 36%, whereas in IV dormitory, where boys from the VII class lived, the affected by dysentery are 25% and by CURW — 75%.

Such evidence proves that the wide spreading of dysentery and CURW cases according to classes, sex and dormitories has no parallel course, thus showing the lack of regular interrelationships and proving furthermore,

their occasional simultaneous (but anyway, independent) development among the children's community; on the other hand it directs epidemiological research work towards looking for dysentery contamination among the girls of the lower classes.

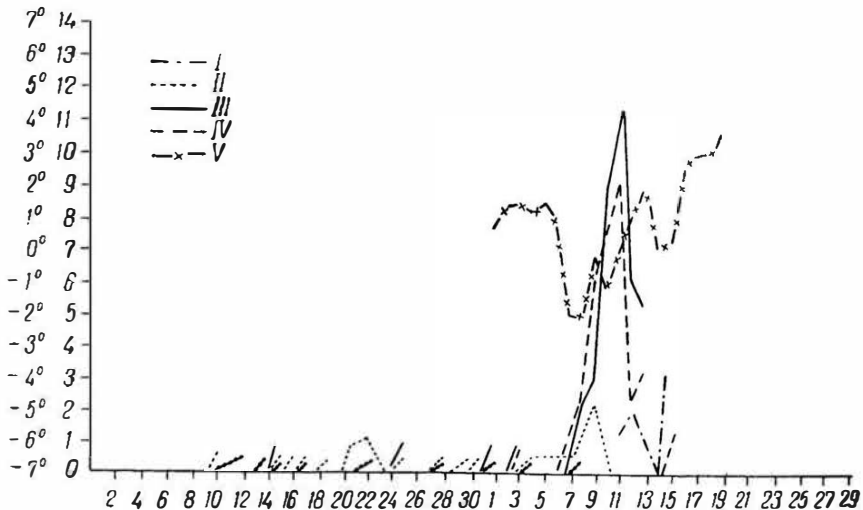
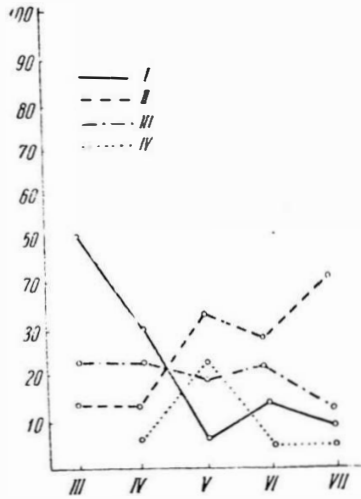


Diagram 1. Dysentery and catarrhal inflammation of upper respiratory ways morbidity and dysenterial contamination in the village G. in percentage

- I—CURW morbidity among children and adults in the village G  
 II— " " " " schoolchildren from the lower classen of the primary school in the same village  
 III— " " " " among schoolchildren of the boarding school  
 IV— dysentery morbidity  
 V— mean daily temperature

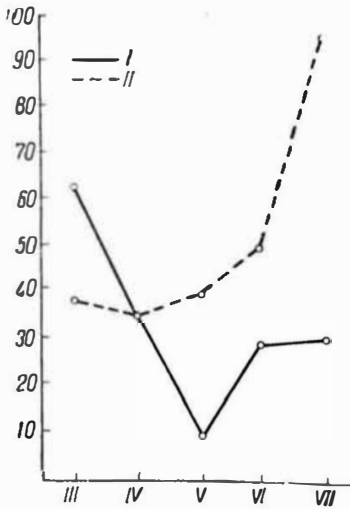
Through investigations on the widespreading of dysentery and CURW cases, we established a difference in the dynamic forces of dysentery epidemic process and CURW.

During the epidemiological studies on dysentery cases, it was established that the school-girl B. P. G. of the III class, living in the II dormitory was affected by dysentery — Sonne in 1963 and during the school year sustained intestinal disorders several times. On 14 January, 1964 and on 3 February, 1964 she got intestinal derangement as well. Bacteriological investigation of her feces revealed presence of *Bact. dysenteriae* Sonne. In the course of the active investigation of the inhabited locality, no persons were detected affected with dysentery or complaining of intestinal disorders. The latter data justify the making of an explicit statement to the effect that B. P. G. in particular was the source of infection in the dysentery epidemic dealt with. This was also confirmed by the bacteriologic investigation of the remaining patients, which in 54,5% were positive for *Bact. dysenteriae* Sonne, whereas among the healthy children 8,5% dysentery infect-carriers were discovered. In dormitory II, where B. P. G. lived, the first cases occur on 8, 9 and 10 February, and chiefly among the



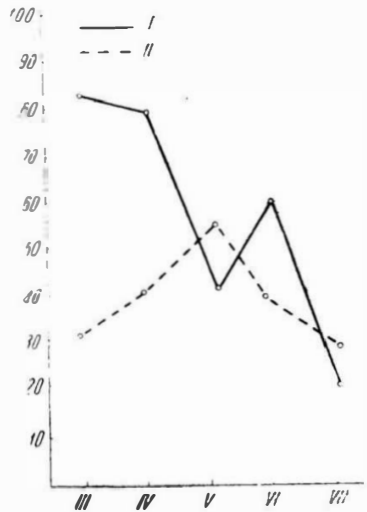
Diagrams 2. Dysentery and CURW morbidity and dysentery contamination in the boarding school according to classes in %

I — dysentery  
 II — CURW  
 III — mixed forms (dysentery and CURW)  
 IV — dysentery contamination



Diagrams 3. Dysentery and CURW morbidity among school-girls per classes in %

I — dysentery  
 II — CURW



Diagrams 4. Dysentery and CURW morbidity among school-boys per classes in %

I — dysentery  
 II — CURW

Table 1

*Morbidity and dysenterial contamination according to classes*

Class	Total number of scholars	Dysentery		CURW		Dysentery contamination	
		abs.	%	abs.	%	abs.	%
III	14	10	71.4	5	35.7	—	—
IV	14	7	50.0	5	35.7	1	7.1
V	17	4	23.2	9	52.2	4	23.2
VI	18	7	38.5	9	50.0	1	5.5
VII	19	5	26.3	11	58.0	1	5.3
Total	82	33	40.3	39	47.6	7	8.5

children having their beds in the immediate vicinity to her's, 1—2 days later — among the children sleeping farther away and lastly — among the children whose beds were placed at the opposite end of the dormitory. The girls of dormitory I, which were connected with the dormitory of B. P. G. and were therefore in close contact, were affected rather early — 9, 10 and 11 February. Therefrom the epidemic chain was spread by means of the common school work in classes also among the boys. Later on, from the class-rooms the epidemic was transferred into the dormitories. Therefore, the epidemic process was developed in the following pattern:

girls' dormitories → classrooms → boys' dormitories.

The epidemiological investigation proved, that among the teachers and serving personnel there were no affected, nor were dysentery bacteria isolated during the two-fold bacteriological investigation. No affections were found in the teachers' families and among the members of the personnel, receiving food from the school kitchen (22 persons). These data warrant the exclusion of the alimentary and water route for the widespreading of dysenterial affection. The winter period excludes the role played by flies as a factor for widespreading. In the course of studies the presence was established of poor social and sanitary-hygienic conditions: 2,15 sq. m. area and 5,3 cm<sup>3</sup> air in the average per child, a single source of tap water for washing for all the school-children (15 sealed to avoid risk of freezing), low level personal and collective hygiene, unhygienic habits as eating finger-nails, common use of various home and school objects. The important role of objects for everyday use, of school appliances and most of all dirty hands, therefore, emerges in the process of dysentery widespreading, i. e. a contact-social epidemic was developed in the closed children's community during the winter.

By studying the morbidity of CURW among children and adult population (school-boys excluded) in the village, it was established that over the period I January to I February it amounts to 2,12%, whereas for the school-boys of the low grades of the primary school — 13,62%. The occurrence of disease cases is sporadic, uniformly distributed in days, with the exception of the peak morbidity rate marked on 9 February of the same

year for the primary school (diagram I). The morbidity rate among the children of the boarding school for the period stated above are also sporadic and scattered, but however, in the period 3rd to 13th February 47,5% of the children are affected. The increase in CURW cases in the primary school and boarding school are completely coincident, which proves that it is provoked by the same cause. Following the dynamics of the mean daily temperature for the same period, an acute decrease is established, beginning on 5 February and reaching minus 1,1°C on 7 February. With lowering of temperature, the increase in the number of cases affected commences, whereas its decrease coincides with elevation of the temperature. Consequently, the relationship is evident between the CURW cases and the mean daily temperature for the period under consideration. A similar causation chain becomes furthermore elucidated, bearing in mind the fact that the children went to bath in town on 8 February and had to wait in front of the public baths after bathing. The older boys had to wait longer than the girls. In the same period, heating in the dormitories was not efficient, nor was in the classrooms. All these facts lay emphasis on the role played by the cold factor for the occurrence and widespreading of CURW cases among the community in the boarding school.

With the purpose of elucidating the etiology of the disease, serological investigations (H. J. T) on 28 affected children were carried out (11 from the primary school in the village); for the purpose smears from the oral cavity and nasopharynx were employed, feces and blood, obtained at the onset of the disease and again 14 days later. The investigations were carried out in compliance with the universally accepted methods by means of inoculation on chicken embryos, newborn mice tissue cultures (from human embryonic kidney and Hela) and H. J. T. as well. As a result of the virological study performed a four-fold increase of the specific gripe A-2 inhibitors was established in the sera of two children from the boarding school, and for gripe C — in the sera of 3 children from the village school. Furthermore, two strains of adenovirus type 3 and three strains untypable vira were isolated from the children of the boarding school.

The low percentage of viral finding, the lack of epidemiological contact between the patients and the clinical picture of the disease obviate the assumption of a wider etiological significance of these vira in the CURW affections observed.

Clinically two syndromes emerged: gastroenterocolitic and catarrhal. In 17 of the 56 affected children the morbid picture was dominated by the former syndrome, in 23 — by the latter and in 16 — by a combination of both syndromes. Thirty nine children underwent hospitalization in the infectious clinic of the Higher Medical Institute — Varna. In 33 of the latter, the anamnestic and physical examination data warranted the diagnosis „dysentery“, confirmed also bacteriologically. The clinical course didn't show deviation from the actual type slight dysentery (in sporadic cases — moderate severeness). However, the catarrhal manifestations involving the upper respiratory ways drew our attention. Most frequently changes were discovered in the throat. The uvular mucosa, the palatal arches and the posterior wall of the pharynx were slightly edematous, hyperemized (in 23 children) and evidence was present for catarrhal tonsillitis in 18 of them. In none of the children grayish coating of epithelial scales was de-

veloped. In 19 children enlargement (up to the size of a bean) of the cervical and submandibular lymph nodes was disclosed, the latter being with soft, elastic consistency and slightly painful on palpation. Pronounced bilateral catarrhal conjunctivitis was present in 6 children. The remaining symptoms were as follows: subjective evidence for pains in the throat in 23 children, headache — 37, colds with serous secretion — 13, hacking cough — 10, herpes labialis — 2, muscular pains — 2. Subfebrile temperature of several days' duration was marked only in 7 children. The general condition of the children affected was not greatly involved. Skin rash was not observed. The spleen was not enlarged. White blood picture was within the normal limits in 31 children. In 4 leukopenia was established with leftside shifting, and in two of the children — moderate leukocytosis (up to 9800).

Clinically no unfavourable mutual influence was established between the mixed infections observed.

### Inferences

1. For the first time a report is made on simultaneous, combined course of dysenterial epidemic process, caused by *Bact. dysenteriae* Sonne and catarrhal inflammation of the upper respiratory ways.

2. The dysenterial epidemic process and the catarrhal inflammations of the upper respiratory ways developed independently without regular connections between them. The simultaneous course of the two conditions bears an accidental characteristics.

3. The source of infection for the dysentery cases is a chronically ill child from the boarding school (B. P. G.), and main route of widespreading — contact-social life.

4. Epidemiologically and clinicalwise no mutual unfavourable effect is established between the two concomitantly spreading diseases in the children's community.

### REFERENCES

1. Вербев П. — Частна епидемиология, С. Медицина и физкултура, 72—104, 1957.
2. Желязков С., Ив. Радев — *Съвременна медицина*, 5, 43—47, 1955.
3. Лебедев В. И. — *ЖМЕИ*, 2, 134—138, 1964.
4. Станишева С., Р. Недкова, Д. Белова — *Въпроси на мед., акушерство и гинекология*, 4, 20—26, 1957.
5. Сахаров П. И. — Ученые записки II Московского медицинского института, 7, 17—23, 1957.
6. Тер-Погосян Р. А., А. А. Камалян — *ЖМЕИ*, 7, 133—134, 1959.
7. Bieling R., O. Gsell — *Die Virus-Krankheiten des Menschen*. Johann Ambrosius Barth, Leipzig, 276—277, 1964.

**НАБЛЮДЕНИЕ ДИЗЕНТЕРИЙНОЙ ЭПИДЕМИИ, ВЫЗВАННОЙ  
BACTERIUM DYSENTERIAE SONNE, ПРОТЕКАЮЩЕЙ ОДНОВРЕМЕННО  
С КАТАРРАМИ ВЕРХНИХ ДЫХАТЕЛЬНЫХ ПУТЕЙ (КВДП)  
В ЗАКРЫТОМ ДЕТСКОМ КОЛЛЕКТИВЕ**

*К. Кузмов, П. Панайотов, В. Зозиков, П. Кокошаров, Г. Капрелян,  
Н. Дыков, М. Радков и С. Николова*

**РЕЗЮМЕ**

Впервые описывается эпидемиологическое и клиническое течение дизентерийной эпидемии, вызванной *Bact. dysenteriae* Sonne, протекающей одновременно с КВДП в закрытом детском коллективе в зимний период.

Выясняется самостоятельное течение дизентерического эпидемиологического процесса, распространение заболевания от КВДП в их случайное одновременное течение в закрытом детском коллективе.

Эпидемиологически и клинически не установлено взаимного неблагоприятного влияния между наблюдаемыми одновременно протекающими инфекционными заболеваниями.