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A NOVEL METHOD TO COMBAT THE CHOLERA EPIDEMIC AMONG THE ROMANIAN ARMY DURING THE BALKAN WAR - 1913

NOVA METODA BORBE PROTIV EPIDEMIJE KOLERE U REDOVIMA RUMUNJSKE VOJSKE TIJEKOM BALKANSKOG RATA 1913

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Summary

The history of cholera, a specific infection caused by Vibrio Cholerae, starts in ancient times. The sixth pandemic that began in 1899 and lasted until 1923, started in India and came to Eastern Europe through Russia. The expansion of the epidemic in the Balkans was facilitated both by the 2 Balkan Wars and the First World War.

Romania, as a participant in these wars was affected by cholera, which was especially common among the army during the Balkan War. If the original source of the cholera issue is still controversial, both Romanians and Bulgarians accusing each other of being the basis of the outbreaks south of the Danube, it is widely recognized that the extent of the disease was facilitated by the sanitary conditions of food preparation and drinking water sources among both Romanian soldiers and in the civilian population.

Under these conditions, in addition to numerous measures against cholera taken by the Ministry of War, Prof. I. Cantacuzino successfully experiments outbreak vaccination for the first time in the world with a vaccine prepared by himself and his collaborators.

The vaccine containing 25 breeds of vibriones was a success in terms of rapid development of a preparation, the application of which was achieved through a quick campaign and proved

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extremely efficient, imposing the Romanian method as an effective way to combat a disease in full outbreak.

Key words: *cholera; vaccine; outbreak; vast Romanian experiment; Ion Cantacuzino.*

Introduction

Background. History of cholera epidemics

The history of cholera, a specific infection caused by Vibrio Cholerae, originates in antiquity. There are documents, old medical manuscripts, confirming the presence of cholera in India, many authors sharing the opinion that the disease spread from there around the world. However, there were others such as Macnamara (1876) which showed that "Hippocrates, Galen and Wang-shooho equally left us evidence of forms of cholera in the countries in which they lived ... But the more carefully we study the writings, the more clear it is that these authors have not encountered the Asian form of cholera " [1].

It is recognized that 1817 was the beginning of a new era in the history of cholera due to the fact that the first cholera pandemic began that year [1].. This will be followed by five others, the last two occurring in the twentieth century.

The sixth pandemic, which was the result of the Muslim pilgrimage of 1902, entered Eastern Europe in 1904 [2]. Outbreaks remained in Asia Minor until 1912, when it was brought to the Balkans by Turkish troops during the First Balkan War.

During the 2-nd Balkan War, not only the Romanian and Bulgarian soldiers were affected, but also civilians of both populations. Three years later, during the 1-st World War, once again cholera epidemic swept Romania.

Cholera vaccination was discovered and first applied to humans by Spanish doctor Jaume Ferran i Clua in Barcelona in 1884.

Since then there have been vaccination attempts during epidemics of cholera, an example being in India [3] between 1893 and 1895 and Russia [4], between 1904 and 1909, but although good results were achieved in some areas, they were not able to impress the medical staff as overall statistics were contradictory because the vaccination had not been rigorously enforced everywhere.

It took the two Romanian cholera campaigns, in 1913 during the Second Balkan War and in 1916 during World War I, to obtain a reliable result and to remove doubts on the efficacy of the cholera vaccine.

Socio-historical and political context

The First Balkan War breaks out in late 1912 between an alliance formed by the small countries of Bulgaria, Greece, Serbia and Montenegro which attacks the aged Ottoman Empire to establish new boundaries in the area. To the surprise of Western Europe, the four Balkan countries together manage to win the war and to push back the borders of the Ottoman Empire close to Constantinople. But once the war ended, dissensions arose between the four allied countries on account of the territories conquered from the Ottomans that each country wanted. Bulgaria, which was the best organized in terms of military, having also German instructors, believed it was entitled to claim territories that belonged to Greece and Serbia.

And so begins the Second Balkan War in 1913, this time among the four former allies. Initially Bulgaria seemed to be winning the war, but it is taken by surprise by Romania siding with Greece and Serbia. Attacked from three sides, Bulgaria surrenders without resistance. Following the peace treaty, signed in Bucharest between July 29 and August 10, 1913, Romania acquires Southern Dobrogea, or The Quadrilateral, precisely the reason why it had entered the war [5].

The Bulgarian campaign does not show evidence of great bravery by Romanian soldiers as the Romanian army did not encounter significant resistance from the Bulgarian troops as these were concentrated against Greece and Serbia.

Epidemiological Context

The most important enemy of the Romanians was not, however, the Bulgarian army, but the outbreak of cholera within the ranks of the Romanian army. The disease appeared not only among the Romanian soldiers, but also among locals and the Turkish prisoners. There are multiple reasons for the occurrence of cholera. Among them, an important reason is the poor organization of the armed services that led to deficiencies in the feeding and sanitary conditions of the Romanian troops. Overall the food was not sufficient, very often the troops not eating at all. The food consisted

of polenta or grits with salt, boiled wheat, etc. Bread, which was brought from the country by the support columns was entirely moulded, thus it had to be discarded. One of the reasons for this was that although the existing bread ovens were capable of baking loaves of 600g, through a misunderstood measure of the quartermaster, an order was given to bake 1000 g loaves. Therefore, the loaves were not fully baked, and being transported warm, they moulded. The canned food distributed by warehouses was fermented. Dishes and firewood were insufficient even for preparing polenta so that it was generally uncooked. They appealed to the locals to prepare polenta or cornmeal cakes, but these were also made in precarious conditions. Also, lack of medicine has led to the proliferation of the disease.

The Romanian side, by the voice of the military leadership, blames the Bulgarian population and the Turkish prisoners for the emergence of cholera. On the other side, the director of the Bulgarian Health Service, publishes a report on the cholera epidemic in the autumn of 1913 in Sofia. Part of Dr. Russeff's findings appear in the November 14, 1913 issue of the "Volya" newspaper. The document, which was then widely debated throughout the Bulgarian media, contains serious allegations against the Romanian "invading" army. It follows that the cholera epidemic that contaminated three quarters of the territory of Bulgaria, was due to negligence committed by the Romanian army. In the four counties occupied by Romanians (Vratsa, Pleven, Vidin, Tarnovo), with a population of 1,372,894 inhabitants, there were nearly 14,000 patients, with 6,700 fatalities, i.e. a rate of 48.5%. In all other counties (Burgas, Varna, Kyustendil, Rusciuk, Sofia, Filipopol), with much greater population and equally unsuitable living conditions, cholera had not taken similar proportions to those in the counties where Romanians were quartered. There were 18,819 patients across Bulgaria; 9,256 dead; 9,563 healed, i.e. a rate of 49%. The Romanian Army was responsible for spreading the epidemic due to the unhygienic conditions and filth in which the soldiers and officers lived: "It is established that the Romanian soldier is very dirty and feeds without selecting his food: uncooked polenta, raw fruit and vegetables, he even drinks dirty water, and others." The "Balgaria" newspaper in its December 17, 1913 issue, also announced that cholera, which had descended upon the country, was due to the Romanian "raiders". The Romanian Army had incurred the heaviest losses (100 graves of Romanian soldiers remained in Orhanie alone), and the cause remained the same: the bad hygiene of soldiers. Romanians did not like to live in the open and used to transform any space they inhabited into a barn. Buildings, streets, markets, churches and

courtyards served as shelter for men and horses alike (Vratsa, Berkovitsa, Ferdinandovo). Supposedly there had even been cases where soldiers opened city sewers to water their horses, to wash their clothes or to bathe (Pleven, Lucovit, Kneja). The conclusion was simple and discrediting: the Romanian army had not done anything to prevent the spread of cholera to the civilian population. On the contrary, the Romanians had endeavored to spread the scourge as much as possible through direct or indirect contamination. However, it is known that up until then Romania had been untouched by the cholera pandemic, only a few cases having been known in ports - Galați, Brăila and Constanța - where they came from Russia[6]. These were quickly extinguished and did not spread due to vigorous health surveillance measures. In 1912 and the first half of 1913 there were no reported cases of cholera throughout Romania.

From the notes of Professor Cantacuzino [7], who was sent to Bulgaria as a hygienist of the army and consultant to the chief of the Military Health Service to try to control the cholera epidemic, we learn that: "In January 1913, 40 cases of cholera broke out in a group of 800 Turkish prisoners who came from Turkey and were being held in Vratsa. The highlight - 16 fatalities. On June 15th, three cases of disease flare up among some Bulgarians living in the city, who have come from Thrace. Very soon, in the same house, two women (mother and daughter) have become ill; the daughter died in about three days (July 1st), the mother is in agony; she is isolated at home." These records, resulting from a rapid epidemiological survey carried out by Professor Cantacuzino immediately after his arrival at Vratsa, along with the fact that the Romanian army was free from cholera when crossing the Danube, demolish Bulgarian allegations and demonstrate that cholera was not brought to Bulgaria by the Romanians.

There are multiple causes of contamination, of which we mention only a few:

- existence of cholera outbreaks among the Bulgarian civilian population.
- quartering troops were other troops had been stationed before (own troops, enemy troops, Turkish prisoners).
- contact with hospital patients due to weapons search.
- continuous contact with the civilian population for food.
- continuous contact with Bulgarian and Turkish prisoners.

– consumption of unexamined water (crude wells, wells in which Bulgarians had dumped animal carcasses, water from rivers, ponds and water puddles).
– bathing in infected rivers or together with Turkish prisoners.
– lack of hygiene in the camp (lack of latrines, disinfectants for latrines, etc.).
– general lack of hygiene and prevention concepts.
– insufficient medical personnel and lack of epidemiological training.

Historical aspects of the occurrence of cholera cases in 1913, during the Balkan War

Although there have been isolated cases of cholera in the south of the country, the effect of this disease had been limited due to surveillance measures until the second half of 1913, when the Romanian army crossed into Bulgaria. At that time, the Romanian army was not vaccinated against cholera. Constantin Argetoianu, who was a military doctor in the 2nd Infantry Division of the 1st Army Corps, tells us in his memoirs, "Pentru cei de mâine, amintiri din vremea celor de ieri" ("For those of tomorrow, memories from the times of those from yesterday") about the appearance of the first case of cholera in an old woman in Vratsa. It appeared on July 9, while Romanian soldiers were camped in Vratsa "... at the bottom of the single dark room, lying on a bench, there was an old woman. We approached her and Laugier began to examine her; after a few minutes he stared at me and said one word: cholera!" [8]. The first case of cholera among the Romanian soldiers appeared on July 13, five days after the first army corps crossed the town of Vratsa, Bulgaria. It would have gone unnoticed had news about cholera not come from all troops stationed around Orhanie. This was also because of the numerous cases of enteritis and food infections with which it might have been mistaken. The epidemic rapidly expanded also due to the accumulated fatigue of soldiers during the forced march. On July 20 there were already 2,000 cases, and the disease was spreading rapidly "Doctors were in demand everywhere, but the doctors were powerless. They could have done a lot more through prophylactic and hygienic measures, but they went unheard." We find many cases that led to the spread of the disease, and these were due to the fact that commanding officers did not listen to doctors, indeed they ridiculed them "... about 10 kilometers (6.2 miles) from Orhanie, a doctor sent in haste found that the source of contamination was a fountain in the middle of the camp and warned against taking water from it. The colonel, a brave

ignorant, took the doctor in banter and to give good example drank a glass of water from the well in question. Three days later he was dead." The decision of vaccination was taken immediately, but it could only be started on July 22. Besides the soldiers who retreated back across the Danube, the civilians from the towns through which the soldiers passed were also vaccinated. Because of the speed of the intervention and the systematic way of the action the last case of cholera was reported in November.

Classical measures for combating cholera in 1913, during the Balkan War

The first measures were stopping the troops around Orhania [9], the banning of raw fruit, stopping soldiers from drinking water from puddles, the refusal of spoilt bread by supply officers, the evacuation of suspects to certain centers prepared ad hoc, the examination of drinking water from wells. Drinking water had to be boiled, and the bodies of humans and animals had to be buried, up to that point the soldiers proceeded to dump them in the Isker river. Hygiene measures start to be taken and laundry soap is distributed. An order of the Ministry of War stated the following [10]:

"To prevent the emergence of infectious diseases the below measures will be taken and executed in the strictest manner:

The utmost cleanliness will be kept both in the camp and in the surrounding area.

It will not be permitted for the men to relieve themselves wherever they wish around the camp and thus infect the atmosphere, but only at the campaign latrines which will be disinfected and covered daily with a layer of earth.

All animal carcasses and remains of slaughtered cattle will be buried by a team of stretcher bearers.

The kitchens will be kept clean, neat and will be inspected several times each day. Cooks will be especially clean and will wash their hands as often as possible with soap and warm water.

All kinds of fruit are strictly prohibited.

Every morning the soldiers' cans will be filled with weak tea, thus replacing drinking water.

Drinking water will be boiled, in no case will drinking of water from swamps be allowed but only from springs or streams.

The troops will only be given boiled food.

The troops will wash with soap more often, especially their hands and before eating.

The physicians of the corps will be watchful of the slightest gastrointestinal trouble and take measures of isolation, and if there is suspicion of infectious diseases, the patient will be evacuated to the contagious section of the Divisional Ambulance.

When the disease is infectious, everyone who came in contact with the patient will be isolated for 5 days.

The avoidance of overworking, the well nourishing and well resting of the troops will be sought as much as possible, so that they will be put in a condition to resist any infection."

A novel method of combating cholera in 1913, during the Balkan War

The Great Romanian Experiment („la grande expérience roumaine") was an important moment in the history of medicine. That was possible due to the illustrious Romanian bacteriologist, Professor Ion Cantacuzino (Jean Cantacuzène), in 1913, during the 2-nd Balkan War. In 1912, Professor Cantacuzino sent a team of doctors headed by C. Ionescu-Mihăiești to study the epidemic in Bulgaria during the First Balkan War. The consequences of these safeguards have resulted in the collection of important epidemiological and microbiological data. Strains of *Vibrio cholerae* were brought and preparations for rapid production of large quantities of the cholera vaccine have been made by the development of methods for mass culture in large balloons. The result was a multi-valent vaccine composed of 25 races of vibriones including 15 brought from the Bulgarian outbreak. Vibrio emulsion was heated for an hour and a half at a temperature of 55-56 degrees. The vaccine concentration was between half a billion and one billion microbes per cm^3.

In the improvised hospital in Orhanie, where about 50,000 Romanian soldiers were camped, Cantacuzino began vaccination. The first inoculation was made on July 21 with a dose of $1cm^3$ to all soldiers without exception. The second inoculation with a dose of 2 cm^3 was done on July 27, and the third inoculation with a dose of 3 cm^3 was done on August 2. The daily appearance

of 100-200 cases was still observed between the first and third inoculation. But immediately after the third inoculation, the epidemic stopped abruptly on the second day, registering only two new cases of the disease [4].

This is the most important moment in the fight against cholera, Professor Cantacuzino requiring the inoculation of troops under full epidemic conditions with the vaccine prepared from strains isolated in Bulgaria. Applying this cholera vaccination performed for the first time in the annals of epidemiology on a large number of individuals, under the conditions of a perfect laboratory experiment, had outstanding results and was known as "the great Romanian experiment". It was described in an article by Professor I. Cantacuzino himself published in the "Annales de l'Institut Pasteur" in 1920.

Throughout this entire process the health authorities were supported by political authorities and especially by King Ferdinand.

On July 17, 1913, the Ministry of War instructs that four sanitary automobiles are to be made available to General Dr. Călinescu and Lt. Dr. Cantacuzino to be employed to combat cholera. Because of the increasing number of cases, there is a mounting concern among Romanian officials, a concern that occurs not only in the armed forces but also in the country, in Bucharest. In the country, this concern translates into a measure which in the eyes of some military officials seemed arbitrary and pointless, even offensive. Professor Cantacuzino is charged by High Order No. 6, to combat the cholera epidemic, in this regard the entire staff of the Military Health Service being at his disposal.

In addition to preventive measures that have been taken immediately, evacuation hospitals, Red Cross hospitals, cholera hospitals were organized, one for each army corps, every corps was endowed with a traveling bacteriology laboratory, hospitals were provided with washing machines, 10 kitchen carriages and 154 campaign kitchens were distributed. All this was done until July 22, 1913, so within 10 days of the outbreak of cholera. This delay is perhaps the only thing attributable to the Health Service, but taking into account that the soldiers moved quickly through Bulgarian territory to achieve the objective, the fact that the rear of the army could not be organized as quickly is understandable. The troops' hospitalizing formations remained behind, but even when they caught up they were not prepared for the unexpected outbreak of cholera.

Professor Cantacuzino – prominent personality of European medicine

Ioan Cantacuzino is a renowned Romanian professor, doctor and academic, the founder of the Bucharest Institute of serums and vaccines, which today bears his name. He attended high school and university courses in Paris and obtained the title of Doctor of Medicine in 1895 with the thesis "Research on the method of destruction of the cholera vibrio in the body". His research focused on the study of Vibrio cholerae and cholera vaccination, active immunization against dysentery and typhoid fever, scarlet fever etiology and pathology [11]. He was highly regarded both at home and abroad, many universities (Lyon, Brussels, Athens, etc.) giving him the title of Doctor Honoris Causa. He was a member of the Romanian Academy and the Paris Academy of Sciences.

Conclusions

Due to the preventive measures taken in a relatively short time, but especially to Professor Cantacuzino's vaccine, the cholera epidemic could be stopped before the troops returned home. The number of victims, both illnesses and deaths, was small compared to the total number of troops that crossed the Danube into Bulgaria, which amounted to approximately 400,000 people. By the official accounts of the Health Service, on August 1, 1913 there was a total of 1929 patients, representing 0.5% of all participants in the war, of which 835 have died, that is 0.25% of those who participated in the war and 43% of those who fell ill. There are contradictions between the various existing data, which means that in fact, the numbers would be much higher, some archive documents speaking of 15,000 ill of which 1600 deaths.

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Sažetak

Povijest kolere, bolesti uzrokovane bakterijom Vibrio Cholerae, seže do antičkih vremena. Šesta pandemija kolere (1899-1923) započelaje u Indiji te je dosegla Istočnu Europu preko Rusije. Rasapu epidemije na balkanskom području pogodovala su dva balkanska rata i Prvi svjetski rat.

Rumunjska, kao jedan od sudionika ratova, bila je zahvaćena kolerom, koja je pogodila prvenstveno redove rumunjske vojske u vrijeme balkanskog rata. Iako je pitanje izvora bolesti još dan danas kontroverzno, pri čemu se Rumunji i Bugari međusobno optužuju da su uzrokom izbijanja epidemije južno od Dunava, jasno je da su rasapu bolesti doprinijeli sanitarni uvjeti pripreme hrane i izvori pitke vode kojima su se koristili kako rumunjski vojnici tako i civilno stanovništvo.

U tim je uvjetima, uz brojne mjere zaštite protiv kolere pokrenute od strane Ministarstva rata, prof. I. Cantacuzino po prvi puta u svijetu uspješno testirao cijepljenje cjepivom kojeg je pripremio zajedno sa svojim suradnicima. Cjepivo je sadržavalo 25 vrsta vibriona i pokazao se uspješnim kako u brzini pripreme tako i u širokoj primjeni, čiju je uspješnost potpomogla brza zdravstvena kampanja. Cjepivo je pokazalo iznimnu učinkovitost, namečući rumunjsku metodu kao efikasni način borbe protiv bolesti u punom jeku epidemije.

Ključne riječi: *kolera; cjepivo; izbijanje; Rumunjski eksperiment; Ion Cantacuzino*