

AD 678243

TRANSLATION NO. 138

DATE: Sept 1968

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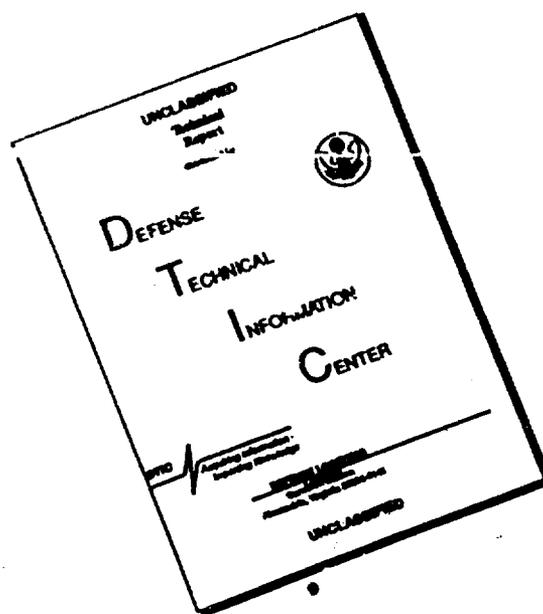
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A. S. Pomicheva, V. S. Uralsva and N. A. Charnenkova

Attempts to use antiphage serums in order to improve the bacteriological diagnosis of Brucellosis in humans.

The difficulty involved in isolating the agent of Brucellosis from study material, taken from an ailing person, and also the agents slow rate of growth in the first generation indicate the necessity for improving on present methods. According to Drozhevskina, the low percentage of positive results during bacteriological studies of human blood, and also the rare isolation of a good culture of Brucellosis is explained by the presence of special bacteriophages in the organism of the ailing person. Using her ideas as a basis, it was decided present methods could be improved to overcome these hinderances.

Several methods were suggested for the above purpose. Of them, the use of antiphages serums seems the most effective.

At the present time there are being used antiphageological serums in the bacteriological analysis of plague, dysentery, cholera and typhus fever. They allow for an increase of the frequency of isolation of a culture of the agents of these diseases (Shak, Rubashkina, Shukov-Vereshnikov and Favorisova, Marina, Dolomanova, Bibikova, Erxolova and Yakobson, Caidanaka and others).

Brucellosis antiphage serum was first obtained by Drozhevskina. Experimental conditions indicated the great perspective of using an antiphage serum to improve the diagnosis of Brucellosis in humans.

In this work we hope to illustrate the possibility of using an antiphage serum in practical work for the bacteriological diagnosis of Brucellosis.

The Brucellosis antiphage serum was put to use in diagnostic work at the therapeutic clinic of the Rostovskii Medical Institute, and at the Rostovskii Anti-brucellosis Station.

A hemo-culture was obtained by sowing blood on a liquid or solid medium, with the addition of the Brucellosis antiphage serum and without it (control).

The liquid medium was sown as follows: a flask with 70 ml of Martin bouillon (pH 6.9) was covered with 0.5 ml of antiphage serum, after which 1 ml of blood, taken sterily from the elbow vein, was added. The control flask was the same, except the serum was not added.

The sowings were put at 37 C for a month. Transplantings onto agar were made every 6-7 days.

To further the application of the antiphage serum, we sowed blood in smaller quantities of bouillon: in place of the flask we used a test tube holding 6-8 ml of bouillon with 0.25 ml of antiphage serum, 0.5 ml of blood were added. Daily sowings of 0.1 ml of this growth were made onto agar disks with antiphage serum and without it.

We made sowings on a solid Martin agar medium (pH 6.9). Ten agar dishes were sown with the blood of a patient, 20 minutes before the blood was added to the agar, the agar was evenly covered with 0.1 ml of antiphage serum. Five dishes contained antiphage serum and five did not (controls). Each dish contained 0.2 ml of blood. The dishes were kept at 37 C for 10 days, subject to a daily inspection.

All together 145 studies were made, using the blood of 80 patients. There were sero-allergical tests for the confirmation of Brucellosis infections.

Table 1 shows results of positive tests only. As can be seen, Brucellosis was detected in 27 people with the use of the antiphage

serum, only 17 without the serum. All together, 43 cultures of Brucellosis were obtained with the use of antiphage serum (21 on agar and 32 on bouillon), only 31 were obtained without the use of the serum (12 on agar and 19 on bouillon).

A very small number of the patients had a chronic form of Brucellosis.

We also used blood from fingers for sowing, according to the method of Mishnaevskii (5 drops of blood on 6-8 ml of bouillon). Table one shows that by this method we obtained 5 cultures of Brucellosis on a medium with the antiphage serum, but only one on medium without it.

An example of the effectiveness of the antiphage serum is illustrated by the following case. The blood of a patient was sown on a medium with the serum, and on one without it. A sowing of 0.1 ml of this medium on agar, with and without the serum, gave very contrasting results. Graphs 1 and 2.

Table 2 shows that the antiphage serum has very little effect in diagnosis during the earlier periods of illness (less than 3 months).

Evidently there is a sufficient mass of bacteria present to allow for a good hemo-culture on ordinary mediums.

The contrast in the sowings of patients with chronic forms of Brucellosis on mediums with and without the serum was greater. Thus, without the antiphage serum, no isolations were possible in 6 patients, with the serum, Brucellosis was isolated from 5 of these patients. In one of these cases the patient had been ill over 10 years.

It is interesting to note that two cultures, taken 22 months and 10 years after the start of the illness, were badly affected by bacteriophages and atypical by characteristics. Upon sowing on a medium without

the antiphage serum they were almost completely lysed by the bacteriophages, did not agglutinate with specific serums and had other variations.

The Brucellosis nature of these cultures was first proven by tests with polyvalent Brucellosis bacteriophages. Then both were injected into guinea pigs, then cultured on mediums with the antiphage serum. They regained their ability to agglutinate with anti-brucellosis serums, to their former level.

It is also necessary to mention that a second check of the patients, after treatment, proved the addition of the antiphage serum necessary. It revealed Brucellosis growths in mediums while the mediums without it indicated not ing.

Another advantage of the serum is that it causes a quicker appearance of the Brucellosis in the first sowings.

Table 3 shows that the serums speed the growth period from 5-7 days to 3-4.

In some cases the difference was even greater (6-21 days) In example: one sowing gave a growth with antiphage serum in 3 days, without the serum--24 days.

CONCLUSIONS

1. The addition of the Brucellosis antiphage serum to the nutritive mediums significantly improves the bacteriological diagnosis of Brucellosis in humans because:

- a. it increases the number of isolations possible (1.7 times);
- b. it is possible to obtain a homo-culture of Brucellosis much later in the period of illness;
- c. it accelerates the growth of the first generation of Brucellosis, as in liquid mediums, so in solid.

2. The above work leads us to recommend the wide application of an antiphage serum for the improvement of the bacteriological diagnosis of human Brucellosis.

Three tables

Two graphs

TABLE 2...Frequency of isolation of a hemo-culture of brucellosis on mediums with and without antiphage serum, in respect to the length of illness

Period of illness	Number of sowings of Blood	Number of hemo-cultures isolated			
		With antiphage serum		Without antiphage serum	
		Agar	Bouillon	Agar	Bouillon
To 1 month	2	1	1	1	1
To 3 months	27	8	12	5	10
To 6 months	22	5	13	3	6
To 9 Months	22	3	4	3	2
To 12 "	12	0	1	0	0
To 18 "	15	0	0	0	0
To 24 "	14	3	1	0	0
To 3 years	13	0	0	0	0
To 4 years	3	0	0	0	0
To 5 years	3	0	0	0	0
Over 5 years	12	1	0	0	0
TOTAL	45	21	32	12	19

TABLE 3....Day of growth appearance of brucellosis on mediums with and without antiphage serum.

No.	Patient	Growth appearance on mediums with serum		Growth appearance on mediums without serum	
		Agar	Bouillon	Agar	Bouillon
1	Fe...	4th	10th	7th	17th
2	Ri....	3rd	6th	5th	13th
3	Yach.....	3rd	6th	5th	6th
4	Fya....	3rd	6th	4th	13th
5	Shcha.....	3rd	11th	--	17th
6	Shcha.....	--	3rd	--	24th
7	Do...	3rd	--	7th	--

APPROXIMATE ILLUSTRATIONS OF GRAPHS 1 and 2 as mentioned in text.



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