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RECEPTIVITY OF THE LUNG TO ANTHRAX SUBSEQUENT TO IRRITATION BY CHLORINE

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RECEPTIVITY OF THE LUNG TO ANTHRAX SUBSEQUENT TO IRRITATION BY CHLORINE

/Following is the translation of a French-language scientific paper by H. Velu, P. Soulie and B. Bellocq in Bulletin de L'Academie de Medecine (Bulletin of the French Academy of Medicine), Vol. 127, Paris, 1943, pp. 175-6./

The customary infectious complications in which pneumococci predominate, are well known for workers subject to chlorine poisoning. In order to exactly determine the risks to which workers are subject in plants which process animal products contaminated by the spores of bacillus anthracis and where exposure to chlorine exists, we produced germination of inactive spores (1) in mice through controlled exposure to chlorine. The necessity for us to separate the infection-producing inhalation from the poison in the same way as the process must occur at the plant, induced us to investigate the duration of receptivity subsequent to a single and acute intoxication.

Our experiments were carried out on 23 groups of 5 mice each, initially subjected to more or less severe irritation and subsequently, within periods of up to 7 days, to contamination by intense (200-500 spores deposited in the lung) or slight (some 10 spores only) inhalation. 46 identical groups served as controls respectively for either intoxication or contamination. The minimum active dose utilized was 150 milligrams of chlorine per cubic meter for 10 minutes.

We recorded the following findings:

1. In the overall picture, contamination was as much more effective in producing pulmonary anthrax, septicemia and exitus as the interval after intoxication was shorter:

Interval	Mortality	Rate in %
24 hours	13/15 (3 groups with 0 non-affected)	86.6
48 hours	12/29 (7 groups with 1 non-affected)	44.3
4th day	7/21 (6 groups with 2 non-affected)	33.3
5th day	0/11 (3 groups all non-affected)	0
7th day	0/15 (3 groups all non-affected)	0

On the 3rd day, 1 group only was treated resulting in 2 deaths out of 4. Contamination which follows or precedes intoxication without any interval produces death in 100 % of the cases.

2. The receptivity of the lung subsequent to sometimes rather severe intoxication (19 out of 115 mice died from somewhat high doses which might have died by infection) therefore did not exceed 4 days.

3. The infection-producing dose of spores seems to have played only a secondary role and the state of lesion which makes possible germination seems to have been more important.

Summary: Although limited in time, the special receptivity of the bronchopulmonary tract to anthrax infection, favorized by acute and single exposure to chlorine, persists for at least 4 days.

References

1 - Bull. de l'Acad. de Med., 125, 1941, p. 159.

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