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On the incidence of Salmonella infections among rats in Colombo

BY

EKKEHARD E. SCHMID, F L. LIEB AND T. VELAUDAPILLAI

(*Medical Research Institute, Colombo*)

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Rodents are considered to be one of the natural reservoirs of Salmonella organisms of the food poisoning group. Surveys on the incidence of Salmonella infections in rats were carried out in many parts of the world. (For references see : Gheorgiu 1926, Ghosal 1941, Kauffmann 1941). The main types reported are S. enteritidis, S. typhi murium, S. newport, and S. thompson.

It was stressed by Ghosal (1941) that in the tropics the association of man and rats is much more intimate as compared with other countries, and that the standards of hygiene in the tropics is lower than that of most western countries. Thus foodstuffs are more easily contaminated by excreta of rats, which contracted a Salmonella infection.

Two hundred and seven rats were examined from July 1951 to February 1952. The rats were trapped by the municipal rat campaign from places all over Colombo, and delivered alive to the Medical Research Institute. The rats were killed by chloroform inhalation and investigated without delay. None of these animals showed signs or lesions due to active Salmonella infections.

The rats were classified accordingly to Manson (1948) and Schwarz (1942). Material from liver, spleen, kidneys, and intestines was inoculated into tetrathionate broth for enrichment and plated on sodium-desoxycholate-citrate agar after 24 and 48 hours' enrichment. Suspicious colonies were isolated and tested biochemically and serologically.

The results are given in the following table.

Subspecies and number of Rattus rattus	*S. typhi*	*S. enteritidis*	*S. weltevreden*	*Total*
alexandrinus 94 (45·4%)	1	3	2	6 (6·4% of 94)
rufescens 67 (32·4%)	—	—	1	1 (1·5% of 67)
frugivorus 42 (20·3%)	—	—	—	—
kandyianus 4 (1·9%)	—	—	—	—
Total 207	1	3	3	7 (3·4% of 207)

Three types of Salmonellae (S. typhi, S. enteritidis, S. weltevreden) were isolated from 7 (3·4 per cent.) of the rats investigated. All positive results were obtained from the intestines only. This is in contrast to the results of other investigators (see above), where positive findings from organs were reported as predominant. We explain this as due to an immediate autopsy after killing the rats, thus avoiding a post mortem migration of the organisms.

All the known types of Salmonella organisms are pathogens for man, animals or both. Some sub-division can be made, as types such as S. paratyphi A, B, C, S. sendai, and S. typhi cause the continuous fever type and bacteriaemia in man, and their findings in animals are markedly less or absent. There are other types such as S. abortus equi, S. abortus ovis, S. typhi suis, and S. gallinarum-pullorum which behave on the contrary as pathogens for animals only. All other types share pathogenity for man and animals. (Kauffmann 1941).

S. typhi, a strict pathogen for man only, was isolated only once, and under special circumstances on a previous occasion from animals. Krogh-Lund (1940) reported that huskies in Greenland when eating human faeces may excrete and spread S. typhi in their own faeces. As S. typhi is the most frequently (69·47 per cent.) isolated strain of Salmonellae in Ceylon (Schmid and Velaudapillai 1951) it is thought that this first finding of S. typhi in a rat is due to the same mode of infection as it is in Greenland.

Among the two other types isolated, S. enteritidis is known to occur commonly in rats, whereas S. weltevreden has not been isolated from rats so far. Their respective rates of findings from man in Ceylon are 1·57 per cent. and 0·78 per cent.

These results stress the importance of a well organised rat compaign, not only for the sake of loss of food either eaten or spoiled by rats, but as a step in public health work. This importance does not compare, however, with the importance of the anti-plague campaigns.

Summary

S. typhi, S. enteritidis, and S. weltevreden were isolated from 7 (3·4 per cent.) of 207 rats trapped in Colombo. S. typhi, and S. weltevreden are reported for the first time as occurring in rats.

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