

SOME ASPECTS OF BRUCELLOSIS

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The occurrence of human brucellosis in Malta is of long standing and has presented various problems ever since it became accurately diagnosable and clearly distinguishable from other prolonged fevers. Between 1896 and 1964 incidence has ranged from a maximum of 81.6 per 10000 inhabitants in 1946 (2410 cases) to 1.7 in 1964 (56 cases). In 1939 centralised pasteurization of milk was introduced but only in a small area (Valletta and Floriana), with a population of about 24000, was the introduction and use of unpasteurized milk then forbidden by law. Gradually this prohibition was extended until it became complete in 1964, the last area in which the ban was made effective being the island of Gozo which, with a population of about a tenth of that of the two islands, had an incidence of brucellosis ranging from a sixth to as much as half of the total number of cases over the period 1953 to 1969. (Agius, 1965)

Between 1956 and 1969 an intensive

study of the disease in the animal population in Malta and of the possible means of preventing it was carried out by an expert working for F.A.O./W.H.O. and the Government of Malta, in conjunction with Government veterinary officials and others. A vaccine was tested, found to be effective and safe and put to limited use. Various measures were taken to control caprine and bovine brucellosis and a decrease was noted both in the animal and in the human incidence of the illness. (Alton G. G. 1968). The reported incidence in man since 1964 has been as follows: 70 cases in 1965, 24 in 1966, 29 in 1967, 14 in 1968, 57 in 1969, and 51 in 1970. Throughout this period the population can be considered to have remained stable at about 320,000. The fact stands out that by 1968 a record lowering of incidence had been obtained and one could reasonably have begun to hope for eradication of the illness. This could only be attained by the eradication of the disease

in the animal reservoir such as has in fact been attained in some countries.

The incidence since 1968, however, is disturbing for instead of the expected further decreases or, at least, stabilisation of the position, there have been notable rises. The writers, working in the Bacteriology Department of the main and by far the largest general hospital in the island, have an opportunity of learning about the occurrence of cases and they believe that the real number of cases is certainly greater though not very markedly so than the number of cases reported. There is often some doubt about the point at which a positive agglutinin titre can be considered as diagnostic of an active and present infection but the incidence would be still higher, judging by laboratory findings, than the reported incidence even if only a titre of 1/320 or higher is taken as significant. In 1970, for example, there were 12 such cases including two with a positive blood culture. Failure to notify does not generally arise from a reluctance to accept the agglutination reaction (at least at 1/320 or higher) as a positive finding but through other causes often purely fortuitous. In fact it is probable that some cases with a titre below 1/320 may be ones of active brucellosis; one such case with a titre of 1/80 had a positive blood culture. In view of this it is likely that the real number of cases markedly exceeds the reported incidence. This is not surprising since this occurs everywhere to a varying extent and can be allowed for. However in our environment and under the prevailing circumstances this has a particular importance. When eradication is being aimed at completeness of notification becomes vital, since the origin of every case must be accounted for. In brucellosis fortunately the human patient is not very important as a cause of other cases but even this aspect should be considered.

How can the cases which have arisen since 1968 be accounted for? The question is not easily answered. Obviously the first point to consider is whether pasteurised milk could have led to infection. In fact a close surveillance of the whole process is maintained, most of it

being of an automatic, self-registering character. Surveillance is exercised over milk as it reaches the consumer both by the laboratory attached to the Milk Marketing Undertaking and, quite independently, by the laboratory at the Head Office of the Health Department, a large number of samples being regularly examined every week. (Report, Health Dept. Malta). No test has ever shown any fault in pasteurization or anything to suggest the possibility of pathogenic micro-organisms having survived the heat treatment. It is also probable that if unpasteurized milk had ever gone out to consumption there would have been a noticeable outbreak comparable in character to that of a water-borne epidemic; this has not been the case.

In every reported case the Health authorities carry out a close investigation, which generally, but by no means always, leads to suspicion being cast on some definite way of infection. Between the 7th and the 22nd March 1969 a milk suppliers' strike led to a suspension of the pasteurized milk service. It was still illegal to sell unpasteurized milk throughout that period but obviously the temptation for the milk producers to sell milk illegally was very great. At St. Luke's during the first 3 months of that year there had been only 5 cases of brucellosis whilst there were 57 cases by the end of December. In 1970 there was a similar strike from the 14th to the 28th April; there had been 22 cases up to April and there were 60 cases in the remaining 8 months. It was not possible to explain every case on this basis; in fact this would apply only in a few cases.

Frequently, questioning rules out the possibility of the infection having arisen from the consumption of milk; a surprisingly large number of persons insist they never use milk as such, the majority maintaining they use either pasteurized or tinned milk. In such cases the alternatives are:

a) contraction of infection through occupational exposure. Locally there have been cases amongst workers in laboratories, in a veterinarian and in a doctor

where one could almost establish the incident which led to infection.

b) through ingestion of accidentally contaminated food. This is often a surmised but cannot be ruled out. One practical possibility is through consumption of meat from animals which could have been harbouring *Brucella* organisms. (Agius Ferrante 1970). Meat from various animals is used in sausages, which could be eaten uncooked. In Malta sausages consist wholly of meat and are fairly widely consumed.

c) through inhalation of dust polluted by urine of diseased animals. This, is only a legitimate surmise.

d) through the consumption of cheese made from infected milk. Patients frequently admit to the consumption of fresh cheese and this then appears as the most likely source. For the information of non-Maltese readers we may say that there are special cheeses made in Malta which are marketed either "fresh", a few days after they are made and still soft, or "dried" for a longer and variable period after manufacture, when they are harder. ("*gbejniet moxxi*"). These latter are sometimes consumed after they have been liberally sprinkled with pepper and steeped for days in vinegar ("*gbejniet tal-bżar*"). Traditionally cheeses are made from sheep's milk and sheep in Malta have been repeatedly proven to suffer much less frequently than goats and cows from brucellosis (Alton 1968). However, even a small proportion of animals could be a source of danger and it is probably true that tradition is occasionally departed from and goats milk is used in cheese making. Moreover, one of the great centres of cheese making is Gozo, where brucellosis is frequent. *Brucella* organisms do survive the cheese making process consisting in coagulation with rennet. One of us cultivated *Brucella* from cheese made by the method adopted locally and using artificially infected milk 3 days after it had been manufactured (Report 1940); Gilli (1943) states it can survive in fresh cheese for up to 44 days. Gargani (1952) found *Brucella* to survive for 90 days. The Joint FAO/WHO Expert Committee on

Brucellosis (Report, 1971) states that *Brucella melitensis* can survive in cheese for 100 days. One is reluctant to attribute the illness to the consumption of cheese since most people eat cheese at some time or other and the explanation may appear too facile, but it very often seems to be the only one discoverable.

Complete eradication of the disease will not occur unless brucellosis is eradicated in the animal reservoirs and this still needs the complete putting into effect of the measures now available. For this a sustained effort fully backed by the local Government and FAO/WHO is essential. At the moment things are not quite right from this point of view but there is a glimmer of hope that they may be righted in the not too distant future. Notification must be more accurate and complete. The consumption of cheese is one source of infection which could and should be dealt with at once. The Milk Marketing Undertaking does produce and sell excellent cheese made from pasteurized milk, but it does so intermittently and the supply does not keep pace with the demand. It is time the sale of cheese made from unpasteurized milk was forbidden: only so can this loophole be plugged. It would be an excellent idea if the making of cheese locally was changed from a cottage industry to a properly organised one selling a safe and guaranteed product. It also appears reasonable to suggest that a warning notice should be displayed when cheese made from unpasteurized milk is being offered for sale. Apart from every scientific consideration one should note that the three types of local cheese are really delectable and could grace a gourmet's table. We have the makings of an excellent industrial enterprise and even export would be a great possibility when the day comes when one can recommend Malta cheese without any fear.

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