Brucellosis summit in Geneva

G.G. Alton & M. Plommet

The sixth meeting of the Joint FAO/WHO Expert Committee on Brucellosis, which was held in Geneva from 12 to 19 November 1985, received a great deal less publicity than the USA-USSR political summit taking place nearby. Nevertheless, the Committee discussed important worldwide issues affecting human and animal health and reviewed the developments in brucellosis which have occurred since 1970, when it last met.

Brucellosis remains one of the most distressing diseases that man catches from animals. It does not spread among humans; each human case has an animal origin. Various species of Brucella bacterium affect almost all animal species, domestic and wild (see table), but it is the farm animals, in which abortion is the chief symptom of brucellosis, that form the reservoir of infection for man and other animals. The bacterium is found in enormous numbers in aborted materials. It also settles in the udder from where it is excreted in the milk, infecting humans who eat the contaminated dairy produce, especially fresh cheeses.

In developed countries cattle are the principal reservoir of infection. Considerable progress has been made in controlling brucellosis by eliminating infected animals, and complete freedom from the disease has been attained in several countries. Nevertheless, even in these countries medical practitioners still need to be on the look-out for cases of brucellosis among immigrants and travellers from infected areas—many of these being popular holiday destinations—and among people who consume dairy products imported from these areas.

Though brucellosis is being eliminated from some countries, its prevalence is increasing in most others. Countries enjoying increased prosperity, often from oil revenues, have attempted to increase supplies of milk and meat through an expansion of their animal industries, generally by importing exotic breeds of animal. Highly susceptible animals are being kept in unsatisfactory conditions, and Brucella infection, often resulting from contact with indigenous animals, is giving rise to epidemics among the animals and associated human populations. In several Eastern Mediterranean countries serious outbreaks of B. melitensis infection in sheep are causing epidemics in people who handle the animals and consume their products. Similar conditions in South-East Asia have led to a dramatic increase in brucellosis of pigs, which causes great concern as it readily infects humans.

Prevention

The problem of human brucellosis will only be solved once and for all when the disease is eliminated from the animal reservoir. Few countries with a severe human brucellosis problem have the resources and infrastructure to achieve this by the elimination of animals that are already infected. Prevention through mass immunization will remain the goal. Fortunately, well-tried vaccines are available. Because the live attenuated strains produce long-lasting antibodies that can confuse diagnosis and sometimes result in abortion if given to pregnant animals, vaccination has been restricted to calves, lambs and young goats. Restriction of immunization to the young limits its impact on

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Brucella species, their animal hosts and their pathogenicity for humans

<table>
<thead>
<tr>
<th>Brucella species</th>
<th>Natural host</th>
<th>Other animal species affected</th>
<th>Human disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. melitensis</td>
<td>goat</td>
<td>wild animals</td>
<td>severe</td>
</tr>
<tr>
<td></td>
<td>sheep</td>
<td>cattle</td>
<td></td>
</tr>
<tr>
<td>B. abortus</td>
<td>cattle</td>
<td>wild ruminants</td>
<td>less severe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>water buffalo</td>
<td></td>
</tr>
<tr>
<td>B. suis</td>
<td>pig</td>
<td>various wildlife species</td>
<td>severe (except biowar 2)</td>
</tr>
<tr>
<td></td>
<td>hare</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>reindeer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R. ovis</td>
<td>sheep (ram)</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>R. canis</td>
<td>dog</td>
<td>none</td>
<td>benign</td>
</tr>
</tbody>
</table>

* A sixth species, B. neutonae, has been found only in the American wood rat and holds little, if any, practical interest.

disease prevalence, and this has stimulated research into methods that can be used on adult animals, whether they are pregnant or not. Two new methods have been developed. The first uses smaller numbers of live bacteria in the vaccine dose, and in the second the vaccine is administered by conjunctival instillation. Even more interesting, Chinese scientists have developed a vaccine for cattle, sheep, goats and pigs that is given orally, in food or drinking-water. This novel immunization method is particularly suited to the harsh conditions of northern China, where the brucellosis problem is most serious. The Committee recommended that its efficacy and safety be studied under different ecological conditions, as a non-parenteral vaccine would be ideal for mass immunization in many countries.

Diagnosis

Studies on the laboratory diagnosis of brucellosis in both man and animals have centred on the enzyme-linked immunoabsorbent assay (ELISA), which promises improved specificity and sensitivity. In animals, important progress has been made in developing simple screening tests, useful where large herds need to be tested in eradication campaigns. A simple but very sensitive spot agglutination test with a buffered antigen of low pH can be used for screening sera of all species, thus reducing the number of sera that require more complicated definitive tests. Another method suitable for identifying Brucella-infected flocks of sheep or goats is an allergic skin test using one of the newer non-sensitizing antigens. Flocks having animals positive to the skin test may then be retested with more accurate serological methods.

Research has resulted in the identification and purification of several bacterial cell fractions, which have provided a means to study the role of several antigens and haptens in diagnostic tests. They have also permitted the study of the immune mechanisms—mediated either by antibodies or by lymphocytes—involved in vaccination protection against brucellosis. Since the last report of the Committee, in addition, the development of Brucella phages has progressed to the point where we now have phages available to identify all six species of the genus (see table).

Treatment

For a long time the recommended treatment for human brucellosis was tetracycline (6-hourly in 0.5 g doses) for up to six weeks or, in order to reduce relapses, tetracycline in combination with streptomycin (1.0 g daily) for the first three weeks. Tetracycline can now be replaced by doxycycline (0.2 g), which is taken once a day. However, a combination of rifampicin (0.6-0.9 g daily) and doxycycline (0.2 g) for six weeks results in rapid clinical improvement, few or no relapses, and better compliance by patients, as both drugs can be given in the morning as a single dose. When available, this treatment is the one recommended by the Expert Committee. During pregnancy, however, rifampicin should be used alone.1

For the first time the Expert Committee in its report\(^2\) spells out methods for controlling brucellosis in animals and humans in the context of WHO’s goal of “health for all by the year 2000”. Details are given of recommendations for action at all levels in the community towards controlling, and where possible eliminating, brucellosis from domestic animals, for protecting humans, and for treating them when this protection fails.


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The case for national alcohol policies

It is possible to see the world of alcohol problems as a battlefield. As far as one can see, from horizon to horizon, there are casualties. Some are already dead, some are dying, and others are still making desperate and pitiful efforts to save themselves...

There is, of course, concern. Faced with such carnage, it would be difficult to maintain indifference, either at a national or at an international level. But concern does not in itself presume effective action. It seems, indeed, that there has been some disagreement about how best to proceed in dealing with the costly and distressing problem of this global battlefield.

Various strategies have been suggested. There are, first the laissez-faire free market economists whose view is that man is by nature a warlike animal; that the carnage is indeed distressing but that, given the right approach, it need not necessarily be quite so costly as seems inevitable at first sight. If the battle is a fact of life, then it can be taxed to the hilt. A proportion of the revenue thus generated may have to go to financing services to alleviate the suffering of the casualties, but in aggregate terms, the world population problem being what it is, it is probably no bad thing to allow the scale of the battle to continue to escalate.

Such a view, of course, is incompatible with the public health perspective, incompatible with a sense of common humanity and incompatible, certainly, with the aims of WHO. What, then, are the health options that are advanced as alternative strategic approaches? There are those who... argue that the first priority must be the welfare of those already damaged... Then there are those who, without wishing to ignore the plight of the present sufferers, believe that the priority must be the prevention of future suffering. There are two separate camps within this group. Supporters of one of these, arguing for health promotion, seek to persuade the combatants to lay down their arms or, at the very least, to use them for sporting purposes only. They are also anxious to counsel those who, though wounded, may yet recover if only they see the error of their ways and crawl away from the battlefield. The other camp... holds the view that the only way to reduce the battle is to reduce the means with which to fight it. They argue for control policies that would restrict the number of cartridges issued daily to combatants, or limit the number of official munitions stores or, like the economists but with a different aim in mind, charge such a high fee for the privilege of fighting that few would be prepared to pay it.

None of these strategies is ridiculous. All have their advantages and would, in one way or another, lead to improvements in the present intolerable state of affairs represented by the alcohol problems battlefield. What is, however, immediately apparent is that, while any strategy might have some effect, all are partial. If, indeed, the level of casualties is to be reduced, then the economists, the treatment agencies, the health promoters and the control policy advocates all need to be brought together. Researchers also need to be persuaded to come out of their bullet-proof hides to help in forming a concerted and integrated approach to the development of a range of linked strategies that can be continuously evaluated. That, in essence, is what a national alcohol policy is all about.

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