BRUCELLOSIS AS A HAZARD OF BLOOD TRANSFUSION

BY

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Since the introduction of low-temperature banks for the storage of blood, transmission of disease by transfusion has become negligible; Mollison (1951) and Whitby and Britton (1953) quote only syphilis, malaria, hepatitis, and some virus diseases as a possibility. Meno Brito (1948) refers to two cases reported at the second Mexican Brucellosis Congress in 1944, in which brucellosis was clearly transmitted by blood transfusion. Subsequently, during two years' work at a children's hospital he found five more instances in which brucella was isolated from the blood of donors, with no indication of clinical brucellosis, but whose blood on transfusion gave rise to the disease in recipients. He gives a table, showing the percentage of positive agglutinations against *Br. abortus* (1.31% in 2,899 donors) recorded at the hospital in 1945 and 1946, and states that, although a positive reaction is not sufficient for the diagnosis of active infection, he recommends that, in Mexico, tests should regularly be carried out to exclude the presence of agglutinins in the donor's blood. Brucellosis has a much lower incidence in this country, but the occurrence of the case described below shows the importance of questioning prospective donors and rejecting those whose state of health is unsatisfactory, particularly those who may be in the incubation stage of an infective disease.

History of the Donor

A married woman aged 53 was a regular donor who had never before felt any after-effects, but who returned home from her donation on October 11, 1952, feeling "very unwell." She did not consult her doctor for 10 days, but complained afterwards that she had been ailing all this time, and a fortnight later, on November 5, she was admitted to Southmead Hospital, Bristol, with undulant fever. On November 7 her serum agglutinated *Br. abortus* to a titre of 1:1280. A blood culture taken at the same time was sterile after 14 days' incubation.

In view of the history and the diagnostic level of the titre four weeks after donation, it seems likely that this woman's blood would have shown a bacteraemia at that time.

History of the Recipient

The recipient, a man aged 27, had lived a "transfusion life" since 1946, when he developed a complete red-cell aplasia shortly after painting with "aeroplane dope." On October 17, 1952, he received his usual weekly transfusion of one pint (570 ml.) of blood, and early in November a report was received from the Regional Transfusion Centre that the donor was suffering from brucellosis. Questioned at his next visit, the patient admitted that he had had a cold, but his temperature was normal and his serum agglutination tests were negative, as they were on three subsequent occasions up to December 28. Indirect questioning failed to elicit any other complaint, and it was not until January 17, 1953 (13 weeks after the transfusion), that he admitted feeling unwell; he then complained of malaise, worse in the morning, slight sweating, also more pronounced in the morning, anorexia, some diarrhoea, and vague pains in the limbs. His temperature was 99° F. (37.2° C.), and examination showed a purpuric rash on both limbs; the liver and spleen were just palpable. His

liver function was known to have been depressed since a homologous serum jaundice in 1949, and there was a severe transfusional haemosiderosis. On January 18 his serum agglutinated *Br. abortus* to a titre of 1:2,560; he was treated with chlortetracycline ("aureomycin"), 250 mg. six-hourly for six days, and his temperature fell to normal. He remained depressed, however, and failed afterwards to attend regularly for transfusions.

He was unable, or unwilling, to give an account of the beginning of his illness, and a visit was paid to his home in the hope of obtaining some information. His mother remembered that he first complained of nausea and abdominal discomfort towards the end of October, when he thought "the jaundice was coming back"; she bought him some medicine from a chemist but did not consult a doctor. Jaundice did not, however, develop. It was decided that he had "gastric flu," and he was in bed, on and off, for several weeks. By Christmas he was very unwell, eating little and feeling increasingly depressed, but by the middle of January his illness was, in his mother's opinion, abating. His milk-drinking habits were investigated, and it seemed certain he took very little milk, and that scalded, in tea and milk puddings. A report from Mr. H. G. L. Harvey states that in his opinion the weight of evidence points to the absence of brucellar abortion on the farm supplying the milk; unfortunately only one of the two cows owned at the time could be traced, but tests on this animal were negative.

Discussion

Spink and Anderson (1950) discuss the transmission of brucella through the blood of an asymptomatic but bacteriæmic individual; they believe that, although a scanty inoculum of brucella will remain viable up to six months at 4° C., from a practical point of view the likelihood of transmitting disease by this route is remote because the organism would be destroyed by the blood or tissues of the recipients. That patients with active disease have relatively few organisms is shown by the difficulty of blood culture and the few colonies generally obtained.

In the above case the recipient had been suffering from a severe aregenerative anaemia and was dependent on transfused red cells for his continued existence. His reticulo-endothelial system was known to be damaged, and it is tempting to speculate that as a result of this he was less competent than a normal individual to deal with the small number of organisms transfused. Agglutinins in this man developed late, but ultimately were in high titre, and it is recognized that a delay of weeks or months may occur even in the normal individual—indeed, that the whole process may pass without any detectable agglutinins being formed at all (Evans, 1934). Hardy *et al.* (1938), studying cases diagnosed in New York whose onset can be accurately dated because the entire milk supply to the city is pasteurized and infection by this means can result only from visits outside the Metropolitan area, stress the insidiousness of onset of the disease and the uncertainty regarding the early symptoms in the patient's own mind. They showed that the prodromal period is often measured in weeks rather than days, and gave the mean incubation period computed to the onset of earliest symptoms as ten weeks and to severe symptoms as 13 weeks (the time at which the disease was diagnosed in the above case). Morales Otero (1930), in experimental inoculation of volunteers, found that symptoms ordinarily causing attention took 28 to 35 days to develop, but he did not use the intravenous route. Unfortunately no clinical details are given in Meno Brito's paper, for it might be expected that symptoms develop more rapidly when infection occurs through the blood stream.

No evidence was found to incriminate milk as a source of infection in the above case, but there was, unfortunately, some difficulty and delay in tracing the two cows responsible for the patient's milk supply at the time. It would, however, seem to be pressing coincidence rather far to postulate a milk-borne source of infection developing

concurrently with exposure to infection through the blood of an individual known to have been in the bacteraemic stage of the disease.

Summary

A case of brucellosis diagnosed 13 weeks after transfusion with blood from a donor in the bacteraemic stage of the disease is described. If accepted, it is the first time that such an infection has been reported in this country, but such cases have been confirmed in Mexico.

Its occurrence illustrates the importance of questioning prospective donors about their health and rejecting those who might be in the incubation stage of an infectious disease.

The insidious onset of symptoms in undulant fever and the delay which may occur in the development of the antibody response are demonstrated.

I would like to express my thanks to Sir Weldon Dalrymple Champneys and to Professor Robert Cruickshank for their interest in this case; to Mr. Geoffrey Harvey, M.R.C.V.S., for investigating the patient's milk supply; to Dr. G. H. Tovey, of the Regional Transfusion Centre; and to the donor's medical attendant, Dr. R. C. Clifford, of Portishead, for his helpful notes. My thanks are also due to Dr. C. T. Andrews, physician to the West Cornwall Clinical Area, for permission to publish this case.

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Medical Memoranda

Lactation from Axillary Tail of Breast

Studying the literature on polymastia, which is taken to include supernumerary breasts, polythelia, and accessory aberrant or ectopic breast tissue in any form or situation outside the normal gland, one is impressed by the universal complaint of those few authors who have interested themselves in these interesting developmental anomalies that the subject has been somewhat neglected by medical writers.

In view of the relative rarity and the paucity of recorded cases, it was thought worth while publishing the following case, especially as no record of an identical one could be found, that of Anderson (1930) being closest in similarity.

CASE REPORT

A 25-year-old primigravida was on October 1, 1953, delivered normally at term of a live female infant weighing 7 lb. 2 oz. (3.2 kg.). On October 4 both breasts were engorged and tender. With expression, they were improved by the next day, but the patient became aware of moisture running down from the right armpit. On closer inspection this proved to be milk, and she was found to have bilateral moderately tender axillary breasts continuous with the main organs. Gentle pressure over the right-sided one caused milk to exude from a skin pore. The swellings were in the situation and relation of the axillary tails of Spence. The one on the left was of the same consistency but slightly smaller, and from it no milk could be expressed through the skin. There was no vestige of nipple or areola related to either swelling or elsewhere in the "milk line." The main breasts were normal, and satisfactory feeding was soon established, with subsidence of engorgement of the axillary tails. These had at no time caused gross discomfort.

Upon discharge from hospital on October 10, the axillary swellings were about half the size initially observed, and

non-tender. Milk could still be expressed from the one on the right, but no longer ran out spontaneously. The infant had regained its birth weight. The patient was seen again on October 21, when the findings were the same as on the day of discharge.

Her mother, who has five children, had not been able to feed any of them, lactation failing in each case at the end of the lying-in period. She has no form of polymastia.

The patient has one sister, aged 24. She attended the antenatal clinic on October 27, when she was about 10 weeks pregnant, expecting her first child, and was found to have a unilateral swelling in the left axilla in the same situation as that of her sister. It was of the same consistency as the main breasts, but with no palpable communication with the one on that side, which was decidedly smaller than the right breast. On the right she has two rudimentary nipples in the "milk line," 3 in. (7.5 cm.) above and below the nipple of the main breast respectively.

COMMENT

Cases of axillary breast previously reported in which milk secretion occurred through a skin pore differ from the above case in that no connexion with the main breast was described (Anderson, 1930; Storey, 1936; de Cholnoky, 1939, 1951). More commonly, cases have been reported in which no milk-secreting duct opened on the surface of axillary breast tissue (Anderson, 1930; Christie, 1938; de Cholnoky, 1939, 1951; Masor, 1952). Some of these had been shown to communicate with the main breast by an isthmus of mammary tissue, others not. Most of these swellings had presented for the first time in the puerperium with the establishment of lactation, and most were very uncomfortable to the patient. De Cholnoky noticed that subjective complaint is much less where there is a connexion with the breast, as the secretion is discharged to and through the normal channels. None of the cases described, however, in which a communication with the main breast could be demonstrated, had milk coming through a skin pore over the axillary swelling.

In order that the presence of axillary breast tissue should not be missed, perhaps a suggestion that the best time to look for it is at or before the first post-natal examination would not be out of place. Storey's criteria are most useful.

I am indebted to Mr. C. W. F. Burnett, under whose care this patient was, for permission to publish the case report.

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Case of Kaposi's Varicelliform Eruption (Accidental Vaccinia)

The following case shows the possibility of accidental vaccinia in a mother from contact with her vaccinated baby.

CASE REPORT

A 10-months-old child was vaccinated on April 2, 1953, in the upper and outer part of the thigh. This was successful, and the usual reaction followed. On April 18 the mother, who had never been vaccinated, developed a papule on the lower part of the left cheek and a sore in the left nostril in the naso-facial angle. A papule appeared on the following day on the posterior aspect of the terminal phalanx of the left index finger and also one on the interscapular part of the back. On April 22 the papules became pustular and there was a tendency towards umbilication. Considerable left infraorbital oedema developed with sub-maxillary adenitis. The temperature rose to 101.4° F. (38.6° C.) and the patient felt ill generally. As there had been several cases of smallpox in the North, a suspicion