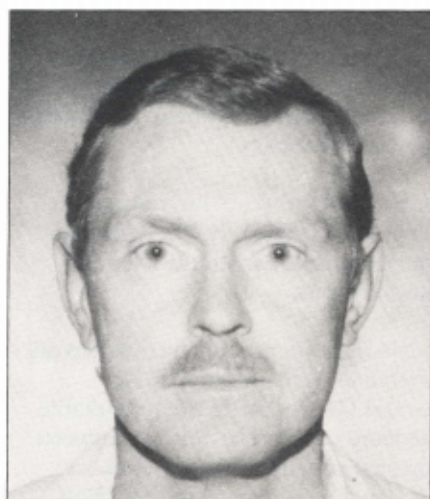


Rubella Reinfection in Pregnancy — Fact or Fallacy? — Dr HF Niebuhr



HF Niebuhr

81 Commission Street
Vryheid
3100

Curriculum vitae

Heinz Niebuhr obtained his MBChB in 1979 at the University of Pretoria. After his internship at Ga-Rankuwa Hospital he completed his two years national service. He then worked for the Provincial Administration as a Medical Officer for a few years. Since 1985 he has been, and currently still is, in Family Practice in Vryheid. In 1990 he obtained the Dip For Med (SA) and is currently enrolled for MPraxMed at Medunsa.

Summary

Rubella reinfection in pregnancy is rare. A case of rubella in pregnancy in a woman thought to have been immune to rubella is presented. A short discussion on congenital rubella syndrome, as well as a literature overview of rubella reinfection in pregnancy is presented.

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KEYWORDS:

Rubella; Rubella Vaccine; Infection; Pregnancy Complications; Reinfection

A 28 year old lady presented on the 10-10-90 with amenorrhoea. She suspected that she was pregnant as her last menstrual period had ended on the 29-8-90. A pregnancy test was performed and this confirmed her suspicion. She left the surgery in good spirits, happy to be expecting her third child.

Both her previous children had been delivered by my partner, as normal vaginal deliveries with no complications. We routinely test for rubella immunity in pregnancy. A check in her patient record revealed that she was immune to rubella. The result of the test performed on 25-3-88 during her last pregnancy was:

IgG: 2,79 (0,00 - 0,99) = Low positive
IgM: 0,01

The pathologist report on the result stated: Patient probably immune due to previous rubella infection.

On 31-10-90 the mother presented her 3 year old child at our surgery

with classical signs of rubella. Double checking her previous records the mother was told not to worry as she had been tested and found to be immune to rubella on a previous occasion. At this stage she was 9 weeks pregnant.

On 13-11-90 she again arrived at the surgery, this time with her eldest (5 yrs old), also with classical signs of rubella. At this visit the mother commented that she was feeling as though she was getting flu.

On 14-11-90 she herself presented with a classical rubella rash, enlarged occipital glands and a temperature. At this stage she was 11 weeks pregnant.

My problem at the time was: "Is this really rubella?" Her bloodtests had stated she was probably immune and yet clinically, and with both her children having just had rubella, it had to be rubella. This obviously had serious consequences.

I discussed the situation at length with the patient. I informed her that the pregnancy could be legally terminated if the diagnosis was confirmed on a bloodtest. A bloodsample for IgM testing was obtained. The patient left the surgery understandably distressed, promising to discuss the matter with her husband. My impression was that she would not hesitate to have the pregnancy terminated if the diagnosis was confirmed.

On 16-11-90 the result of the bloodtests came back with the pathologists report:

IgM: 0,05 Negative.

Comment: The negative IgM result indicates no recent exposure to

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rubella. The rubella IgM antibody, however, only becomes detectable 2-6 weeks after exposure to rubella virus. If rubella is still suspected, a repeat sample should be submitted in 10-20 days.

This result was discussed with the patient and her husband. They fully understood the implications and had decided to have the pregnancy terminated if the diagnosis was confirmed.

On 29-11-90 the second and long awaited IgM test was returned with the following result:

IgM: 0,01 = Negative.

In the meantime the patient's husband had also contracted rubella - his proven on bloodtest -

IgM: 1,170 = Positive

The dilemma in this situation was:

- * What do I tell the patient? Do I stick to my clinical diagnosis and insist that she has had rubella and

Neither a primary attack of rubella nor successful immunization, protects one from reinfection

that I would still advise her to have the pregnancy terminated in spite of negative blood results?

- * Could this pregnancy be legally terminated without laboratory evidence of rubella infection?

In desperation I phoned a gynaecologist in Durban for his advice. I gathered from his response

that he would not be prepared to terminate the pregnancy on clinical evidence alone.

I then phoned another gynaecologist in Pietermaritzburg (he had been a GP for a number of years before specializing) and explained the situation to him. He agreed to see the

Rubella IgM antibody is only detectable 2-6 weeks after exposure to rubella virus

patient and felt that as I was so sure of my diagnosis, and bearing in mind that the rest of the family had also had rubella, he would be prepared to contemplate termination. Fortunately he phoned the laboratory and asked them to repeat the test on the same blood specimen. The result on this (the same blood) was:

IgM: 1,253 Strongly positive!

This result solved the problem and the pregnancy was eventually terminated. On sonar, before the evacuation, no foetal heart was detectable. At evacuation the gynaecologist found that the foetus was already dead and nature had already performed its function while we were worrying about bloodresults.

Discussion

Congenital rubella syndrome. (CRS)

Rubella was originally described in Germany by de Bergan in 1752.³ Rubella was officially recognized as a distinct clinical entity as recently as 1881 at an international congress in London. Before that time there had

been confusion and controversy as to whether it was a form of measles or scarlet fever (or both), and what it should be called ("Rötheln", German measles or rubella).¹

For the next 60 years little attention was paid to rubella. It was regarded as a mild disease, with no serious complications.

In 1941 the picture changed when an Australian ophthalmologist, Dr Normal Gregg, made the remarkable discovery of the relationship between maternal rubella during pregnancy and congenital defects in the infant. He had noticed a sudden increase of newborn infants with congenital cataracts. On enquiry he found that the mothers of most of them had contracted rubella when they were in early pregnancy during the 1940-1941 epidemic.¹

Congenital rubella is acquired from maternal infection with the rubella virus. This infection, acquired in utero, is one of the few viral

... the foetus was already dead, nature had already done its duty, while we were worrying about blood tests

infections convincingly associated with the genesis of foetal abnormalities. It is now clear that congenital transplacental infection of the foetus occurs as a consequence of maternal infection (which may or may not be clinically evident) usually in the first trimester of pregnancy. The virus is demonstrable in placental and foetal tissues obtained by therapeutic abortion at the time.

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If the pregnancy is not interrupted, foetal infection persists, and upon delivery of the infant, the virus is recoverable from the throat, urine, faeces, conjunctivae, bone marrow and CSF in the living infant and from most organs at autopsy.¹⁶

The clinical presentation of the infants include: cardiac lesions (usually patent ductus arteriosus),⁴ cataracts, glaucoma, microphthalmia

50% + experienced rubella reinfection with vaccine induced immunity, but only 5% with natural immunity

and esophageal atresia.^{3,16} Other signs that can be present are: thrombocytopenic purpura, hepatosplenomegaly, corneal clouding, fullness of the fontanels, lesions of the longbones and abnormalities of the electroencephalogram.

Foetal infection after maternal reinfection with rubella virus

Reinfection with rubella may occur and has been reported after both naturally acquired and vaccine induced infection.⁸ Reinfection is usually subclinical and is detected serologically, most commonly among pregnant women who have had close and prolonged contact with rubella at home. Reinfection in pregnancy has been considered to present minimal risk to the foetus, and mothers are usually reassured that there is no risk or only a minimal risk to the foetus (about 5-10% of babies are affected - more recent studies claim this to be even less). Nevertheless, there have

been several isolated reports of foetal infection and malformation resulting from maternal reinfection.^{5,7,9,13,15} In studies with primary rubella infection it was found that congenital defects, frequently multiple, occur in up to 90% of infants of mothers infected during the first 10 weeks of gestation.¹⁴

Incidence of reinfection:

Studies carried out established that neither a primary attack of rubella nor successful immunization always conferred lifelong immunity and that reinfections can occur.² Investigations of antibody positive individuals exposed to rubella during outbreaks showed that over 50% of contacts with vaccine induced immunity experienced reinfection compared with only 5% of those with natural immunity.¹⁴ Subsequent studies have shown that reinfection is most likely in individuals whose antibody titres had declined to a low level since vaccination.¹⁴ The true incidence of reinfection is not known but judging from reports to the Communicable

... shows that clinical judgement is of primary importance even though blood results may still show the opposite

Disease Surveillance Centre from laboratories in England and Wales it is common. From July 1988 to June 1989 a total of 101 confirmed infections in pregnancy were reported, of which 35 were probably reinfections. As reinfections are usually asymptomatic, they only come to light when investigating women

who have been in contact with rubella. The number of cases diagnosed in a laboratory are therefore probably less than those actually occurring.

Routine testing for rubella in pregnancy is very important

Risk to the foetus in maternal reinfection:

The risk to the foetus is substantially lower than that of the primary infection. As mentioned earlier a number of cases have however been documented of congenital rubella syndrome after maternal reinfection.

Criteria for defining reinfection:

Distinguishing between primary asymptomatic rubella infection and reinfection is critically important when a woman is in the early stages of pregnancy. Providing appropriate sera are taken, the distinction can usually be made on the basis of the serological response at the time of the infection. In both primary infection and reinfection there is a significant rise in rubella specific IgG antibody, but in a primary infection there is also a strong IgM antibody response which persists for about six to eight weeks. In a reinfection IgM antibody is either not produced or found only in low concentrations. Thus reinfection can be diagnosed if the initial sample taken from a contact is IgG positive and a rise in titre is subsequently demonstrated, with a low level IgM response.^{8,11} A working party of the British Medical Research Council's subcommittee on rubella vaccines, recommended that

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evidence of reinfection would be accepted if a person with pre-existing rubella antibodies showed a significant rise in IgG antibody concentration. IgM antibody is either not produced or found only in low concentrations. If serum samples obtained before reinfection were not available for retesting, evidence of pre-existing antibodies would only be accepted if at least two previous reports detecting antibodies are available. Documented proof of rubella vaccination with one other positive test for antibodies would also qualify.^{6,8,10,14}

Clinical management of the problem:

Because of the growing number of well documented cases of congenital rubella syndrome after maternal reinfection, pregnant contacts who have been reported rubella antibody positive (ie those fulfilling the above-mentioned criteria) in the past, can no longer be reassured that their foetus is not at risk. Serological investigations of all pregnant contacts irrespective of rubella antibody or vaccination history must therefore be considered.¹²

Conclusion

Even though this patient does not fulfil the above criteria for rubella reinfection (only one previous serum sample indicated immunity, no documented proof of vaccination and only a raised IgM - unfortunately no IgG estimates were done), it still illustrates the importance of clinical judgement and the importance of routine testing for rubella screening in pregnancy.

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