Rubella and Congenital Rubella Syndrome:
Some Facts

The Health Authorities have insisted that the monovalent vaccines against measles, mumps and rubella would not be made available in the United Kingdom. By doing so, they have effectively forced parents who had serious concerns about the MMR vaccine not to vaccinate their children altogether. As vaccination rates fell and the threat of measles outbreaks became real, the health authorities blamed Andrew Wakefield and his research. Obviously no one mentions the fact that Dr. Wakefield has always supported measles, mumps and rubella vaccination of toddlers and that he has only suggested that the monovalent vaccines be made available, alongside the MMR vaccine, just to give parents a choice.

Dr. Simon Murch in a recent interview introduced the threat of a rubella outbreak and the resulting Congenital Rubella Syndrome (CRS) cases in his support of the MMR vaccine. This represents a whole new front. It is more than likely that the health authorities will now find a poor family that has been devastated by having a child with CRS to demonstrate how sad this disease is. Having cared for these children, I can testify that CRS is a terrible disease and that we must do everything we can to prevent it. On the other hand, Autism is just as awful a disease and like CRS, it destroys the child and the family. The only difference is that presently autism in England must outnumber CRS by 5000 to 1 conservatively. So if journalists are going to be interviewing CRS parents, it is only fair that they also write stories about the equivalent number of families that have been destroyed by regressive autism and who have witnessed their perfectly healthy normal toddlers disappear. One must remember that in 2002 in California (Population 34.5 millions), TEN new cases of autism accessed services every day.

Had the monovalent vaccines been made available 2 years ago as suggested by Dr. Wakefield and had the single rubella vaccine been administered to every child in the UK, ONE WHOLE YEAR after the single measles vaccine, the vaccination rates of both measles and rubella would be at 95% right now. Obviously the health authorities could have also chosen a shorter waiting period. After all, the single vaccines used to be administered every 3 months in the pre-MMR days.

On such a short notice, I am unable to review the incidence of CRS in the United Kingdom.

The following is from the CDC’s, Epidemiology and Prevention of Vaccine-Preventable Diseases, 5th Edition (1999) starting page 176. The editors of that issue were Atkinson, W, Humison S, Wolfe C and Nelson R.

“Rubella and congenital rubella syndrome became nationally notifiable diseases in 1966. The largest annual total of cases of rubella in the United States was in 1969, when 57,686 cases were reported (58 cases per 100,000 population). Following vaccine licensure in 1969, rubella incidence fell rapidly. By 1983, fewer than 1,000 cases per year were reported (<0.5 cases per 100,000 population). A moderate resurgence of rubella occurred in 1990-1991, primarily due to outbreaks in California (1990) and among the Amish in Pennsylvania (1991).

Until recently there was no predominant age group for rubella cases. From 1982 to 1992, approximately 30% of cases occurred in each of three age groups: < 5, 5-19, and 20-39 years.
Adults > 40 years of age typically accounted for < 10% of cases. However, since 1994, persons 20-39 of age have accounted for more than half of the cases. In 1997, this age group accounted for 77% of all reported cases. Most persons with rubella in this age group were born outside the United States, in areas where rubella vaccine is not routinely given.

In the pre vaccine era, epidemics of rubella occurred every 6-9 years, with the last major U.S. epidemic occurring in 1964-1965. No large epidemics have occurred since the vaccine was licensed for use in 1969....

CRS surveillance is maintained through the National Congenital Rubella Registry which is managed by the National Immunization program. The largest annual total of reported CRS cases to the Registry was in 1970 (67 cases). An average of 5-6 CRS cases have been reported annually since 1980.

Although reported rubella activity has consistently and significantly decreased since vaccine has been used, the incidence of CRS has only paralleled the decrease in rubella cases since the mid 1970’s. The fall in CRs since the mid-1970’s was due to an increased effort to vaccinate susceptible adolescents and young adults, especially women.

Rubella outbreaks are almost always followed by an increase in CRS. Rubella outbreaks in California and Pennsylvania in 1990-1991 resulted in 25 cases of CRS in 1990 and 33 cases in 1991. A provisional total of 9 CRS cases were reported in 1997. The mothers of all these infants were born outside the United States, primarily in Latin America and the Caribbean, where rubella vaccine is not routinely used.”

The population of the United States was 248.5 million in 1990 and 281.4 million in 2000. The population of the United Kingdom was about 57 million in 1990 and 59 million in 2000. Assuming that the population of the UK is more than one fourth that of the USA and stipulating that the incidence of rubella and CRS is about the same in the two countries, then, it is likely that before the introduction of the rubella vaccine, there may have been at most 13,000-14,000 cases of rubella and 15-16 cases of CRS in the UK in any year. The 33 cases of CRS in one year (1991), the highest in the US since the vaccine, would translate to 6 cases in one year in the UK and the average of 6-7 cases per year in the US would be an average of one to two cases in the United Kingdom; there were 4 cases of CRS in The USA in 1995 and 2 in 1996. For the record, I firmly believe that ONE case a year of CRS is one too many.

The following statement is important: “From 1982 to 1992, approximately 30% of cases occurred in each of three age groups: < 5, 5-19, and 20-39 years... However, since 1994, persons 20-39 of age have accounted for more than half of the cases. In 1997, this age group accounted for 77% of all reported cases. Most persons with rubella in this age group were born outside the United States, in areas where rubella vaccine is not routinely given”. Whatever the reason, it is alarming that rubella, a childhood disease, is now occurring more frequently in susceptible women. It can be argued that if the women in that group had contracted rubella as children, when the disease is fairly benign, they would have acquired solid lifetime immunity. This appears to be supported by the fact that in 1969, when the rubella vaccine was licensed, there were 57,686 cases of rubella (reported) and 62 (0.1%) cases of CRS while in 1997, there were 181 reported cases of rubella and 9 (5%) cases of CRS.
A study from Greece by T. Panagiotopoulos T. et al. published in the British Medical Journal (BMJ 1999;319:1462-1467) reports that:

- MMR has been administered to children in Greece since 1975
- In 1993, the incidence of rubella in young adults was higher than in any other recent year
- That there were 25 serologically confirmed cases of CRS (24.6/100 000 live births, largest since 1950) that year.
- “With low vaccination coverage, the immunization of boys and girls aged 1 year against rubella carries the theoretical risk of increasing the occurrence of congenital rubella” wrote the authors.

On page 175 of the same CDC publication quoted earlier, the authors state that presently “Up to 85% of infants infected in the first trimester of pregnancy will be found to be affected if followed after birth.” It is not clear whether the authors refer to CRS or to other less serious complications. Older pediatricians, this one included, did not see 80-85% of children whose mothers developed rubella in the first trimester of pregnancy, come down with CRS. In the late 50’s we believed that incidence to be around 25% and we thought that even those odds were awful.

The following comprehensive review of rubella in pregnant Danish Women (1975-1984), by M. Mitsch, was published in the Danish Medical Bulletin in March1987 (34:46-49). It is one of the largest studies ever done and it also shows how just few years ago, the clinical picture was different. Its results are summarized in the following table from WAVES, the New Zealand vaccine review.

WAVES Vol. 11 No. 4 p. 21

**RUBELLA RISKS FOR PREGNANT WOMEN**

**DANISH MEDICAL BULLETIN MARCH 1987**

A study of pregnancy outcomes of 1346 women serologically identified with rubella between 1975 and 1984.

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
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<tbody>
<tr>
<td>623 chose abortion</td>
<td>672 chose to continue pregnancy</td>
</tr>
<tr>
<td>No further data – assumed no foetal autopsies</td>
<td>113 lost to follow-up</td>
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<tr>
<td></td>
<td>559 total</td>
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<tr>
<td></td>
<td>35 aborted spontaneously</td>
</tr>
<tr>
<td>stillbirths</td>
<td>Total foetal deaths = 39 (6.97%)</td>
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<td>------------</td>
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</tr>
<tr>
<td>4 stillbirths</td>
<td>623 deaths 520 live births</td>
</tr>
</tbody>
</table>

- cord samples taken for rubella testing.
- 111 had rubella specific IgM (21.34% infection rate)
- 14 of those were infected prior to 12 weeks and 7 of those had serious malformations (6.3% of 111)

**OUTCOME:**

- 513 normal
- 0% healthy child outcome

91.77% healthy child outcome

The Danish study concluded:

1. Not all foetuses are infected (21.34%)
2. Not all infected foetuses have malformations (6.3%)

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**NOTE:** The above table was listed as a historical reference of the incidence of CRS in Denmark between 1975 and 1984. It does not apply to present times in the UK and the US. It is probable that, as mentioned, CRS will occur proportionately more frequently now.

An argument one hears often is that toddlers must be vaccinated because if they are not, they can come down with rubella and infect their susceptible pregnant mother or teacher. Clearly the best way to prevent that dangerous situation is to make sure that the female adult herself is immune not all the children around her.

Susceptible pregnant women in their critical first trimester may be exposed not only to children but to infected adults and especially healthcare workers. The following abstract of a study by Dr. Walter Orenstein, now Chief of the Vaccine Immunization Program at CDC describes such potential risks.

**Rubella vaccine and susceptible hospital employees. Poor physician participation.** Orenstein WA, Heseltine PN, LeGagnoux SJ, Portnoy B

A serosurvey of 2,456 high-risk employees of the Los Angeles County-University of Southern California Medical Center showed that 345 (14%) were susceptible to rubella. Of 197 seronegative personnel followed up for participation in a vaccination program, 105 (53.3%) were vaccinated. However, only one of the 11 known susceptible obstetrician-gynecologists was vaccinated. Thirty-eight seronegative employees who were vaccinated with RA 27/3 rubella vaccine were queried four to six weeks after
vaccination and compared with 32 unvaccinated seropositive control subjects. Although the reaction rate was 50% among vaccinees and 3% among control subjects, each vaccinee lost only an average of 0.2 workdays compared with 0.1 workdays for control subjects. The high rate of susceptibility to rubella among hospital employees supports the need for screening. Although vaccine reactions are common, they are generally mild. Means must be found to ensure greater employee acceptance of vaccine. PMID: 7463660, UI: 81120098 JAMA 1981 Feb 20;245(7):711-3

Although it is highly advisable that all mothers be immune to rubella, maternal immunity does not always guarantee that the fetus will not develop CRS:
“Two children developed congenital rubella infection when their mothers had been proven to be satisfactorily immunised against rubella before the affected pregnancy. One child was severely affected with heart lesions, brain damage, severe deafness, physical retardation, cataracts and rubella retinopathy. The other child had moderately severe sensorineural deafness and a mild reduction in visual acuity due to rubella retinopathy”


“We report a case of a patient who had a subclinical rubella infection in the first trimester of pregnancy which resulted in the delivery of a baby suffering from congenital rubella. Rubella virus vaccine, live attenuated (Cendevax) vaccine had been administered to the mother nearly three years before, with proven sero-conversion from a rubella haemagglutination-inhibition titer of 1:10 to 1:80.”


“A 2 1/2 year-old girl was found to have congenital rubella syndrome. She presented with microcephaly, mild developmental delay, partial sensorineural deafness and cerebellar atrophy. Blood titers of rubella hemagglutinin were 1/256 and 1/512 (exclusively IgG). She had not had rubella, nor had she been immunized against it. The mother had been immunized against rubella 4 years before her pregnancy with this girl and 2 years later blood hemagglutinin titers were 1/32 and 1/64. She was neither exposed to nor suffered from rubella during the pregnancy”


“No population studies have evaluated the effectiveness of screening and vaccinating susceptible individuals in reducing the incidence of CRS. Of the 21 CRS cases reported in the U.S. in 1990, 71% of the mothers had a positive serologic test, while 43% gave a history of vaccination”


In Summary:
- Rubella is a rather benign illness in childhood.
- Rubella vaccination at an appropriate age should be encouraged.
- The administration of the single rubella vaccine, 3 or 6 months, after the measles monovalent vaccine was very well accepted for years.
- Resumption of that schedule may be welcome by those who have MMR concerns.
- The majority of parents can still request the MMR vaccine for their children.

Now that is a win-win situation.
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