بسم الله الرحمن الرحيم

M.S.Thesis

Screening of Rubella virus antibodies in umbilical cord blood of neonates

Submitted By

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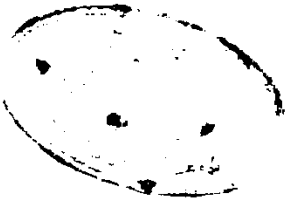

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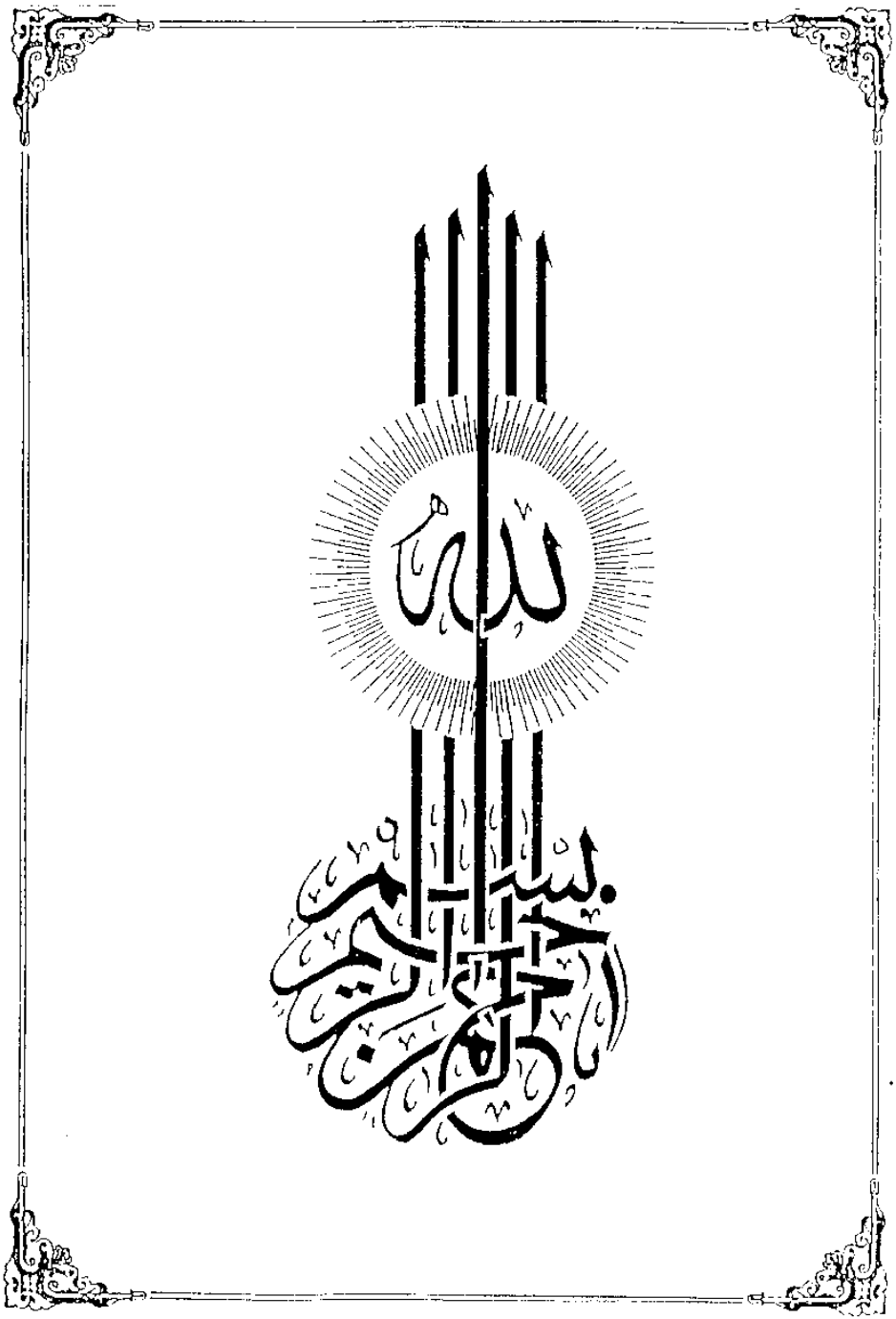

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RUBELLA

(German measles)

Rubella is an acute infectious disease charactarized by minimal or abscent prodromal symptoms, a three-day maculopapular rash, and generalized lymph node enlargement,particularly of the postauricular, suboccipital and cervical lymph nodes,and a low grade fever. The disease is endemic throught the world and occurs in periodic epidemics in older children and adults the infection may occasionally be severe,with such manifestations as joint involvement and purpuric rashes. The disease has serious implications when it occurs in a pergnant women. The rubella virus can create an intrauterine infection and cause fetal death,spontaneous abortion or a variety of congenital anomalies. Since 1941,a great deal of interest has been focused on this disease because of the association of rubella during pregnancy with an increased evidence of congenital malformations.

REVIEW

HISTORY

HISTORY

Rubella was first recognized by German physicians in the eighteenth century,German measles was regarded as a variant of measles and or scarlet fever. Maton described it as a separate entity in 1815;Wagner emphasized it's distinction from measles and scarlet fever in 1826;and in 1866 Veale in Edinburgh called the disease rubella. In 1914 Hess postulated,because of his transmission studies with rhesus monkeys,that rubella was caused by a virus.This observation was not confirmed until 1938 when Hiro and Tasaka produced the disease in children by inoculating them with filtered nasal washings obtained from patients during the acute phase of rubella. Sir Norman Gregg (the Australian opthalmologist) in1941 reported the association of intrauterine rubella infection with congenital cataracts. Habel in 1942 also sucessfully transmitted rubella to the rhesus monkey,using nasal washings and blood. Reports by Anderson in 1949 and by Krugman and ward in 1953 confirmed Hiro and Tasaka's findings. Krugman and ward in 1953 and 1954 demonstrated that rubella virus was present in the blood two days before and on the first day of rash and proved conclusively that rubella can occur without a rash. The cultivation of rubella virus in tissue culture was reported independently and simultaneously by two groups.Weller and Neva in 1962 observed a cytopathic effect in human amnion cells. At the same time,Parkman and colleagues (1962) isolated the virus in cultures of African green monkey kidney tissue. Since 1964 Pandemic,the congenital rubella syndrome has been recognized as an active contagious disease with multisystem involvement.

ETIOLOGY

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The rubella virus is an RNA virus,it is classified in the togavirus group,usually described as between 50 and 100μ in size. The virus hemagglutinates at low temperatures only. Rubella virus is markedly sensitive to heat,to extremes of PH and to a variety of chemical agents. The virus is rapidly inactivated at 56°C. However at 4°C,the virus titre is relatively stable for 24 hours. For long term preservation of the virus,a temperature of-60°C is much better than usual deep freeze temperature of -20°C. The virus is inactivated by a PH below 6.8 or above 8.1,ultraviolet irradiation,ether,chloroform,formalin,B-propiolactone and other chemicals. It is resistant to Merthiolate (1:10,000 Solution) and antibiotics. Virus replication is not inhibited by 5-iodo-2-deoxyuridine (IDU) but is inhibited by amantadine hydrochloride. Rubella virus has been cultivated in a variety of tissue cultures. In general,the virus produces interference (i.e.the multiplication of one virus in a cell usually inhibits the multiplication of another virus entering subsequently) Without cytopathic effect (i.e.the destructive changes of the cells caused by the virus in which it multiply) in the following primary tissue culture cells: African green monkey kidney,bovine embryo kidney,guinea pig Kidney,human-amnion and human embryonic Kidney. Interference without a cytopathic effect has been observed in rhesus monkey and human diploid cell lines. Rubella virus starins

belong to one serologic type. Hemagglutination and complement fixing antigens have been prepared in several tissue culture systems. The inhibition of these antigens by specific rubella antisera has formed the basis for practical serologic tests. The presence of rubella virus is demonstrated by the ability of rubella infected African Green monkey kidney cells to resist challenge with enterovirus. During clinical illness, the virus is present in the nasopharyngeal secretions,blood,feaces and urine. The virus has been recovered from nasopharynx 7 — days before exanthem and from 7 to 8 days after it's disappearance (Krugman and Ward,1977).

POSTNATAL ACQUIRED RUBELLA

POSTNATALLY ACQUIRED RUBELLA

CLINICAL MANIFESTATIONS

The first symptoms of rubella occur after an incubation period of approximately 16 to 18 days,with a range of 14 to 21 days. In the child,the first apparent sign of illness is the appearance of the rash. In adolescents and adults,however,the eruption is preceded by a 1-5 day prodromal period charactarized by low grade fever,headache,malaise,anorexia,mild conjunctivitis, coryza,sore throat,cough,and lymphadenopathy. These symptoms rapidly subside after the first day of rash. Forchheimer spots, may be observed in many patients during the prodromal period or on the first day of rash. It consists of reddish spots,pinpoint or larger in size,located on the soft palate. In scarlet fever the soft palate may be covered with punctate lesions,and in measles it may have a red,blotchy appearance;these lesions are indistinguishable from the enanthem of rubella. Obviously, the so-called Forchheimer spots are not pathognomonic for rubella and do not have the same diagnostic significance as koplik's spots in measles(Krugman and Ward,1977).

Lymph node involvement. Observations made of patients with experimentally induced rubella or during epidemics indicate that lymph node enlargement may begin as early as 7 days before onset of rash. There is generalized lymphadenopathy,but the nodes

most commonly involved are the suboccipital,post-auricular and cervical nodes. The swelling and tenderness are most apparent and severe on the first day of rash. Subsequently,the tenderness subsides within a day or two,but the palpable enlargement of the nodes may persist for several weeks or more. The extent of the lymphadenopathy may be extremely variable,and occasionally it may even be abscent. At times,splenomegaly also may be noted during the acute stage of the disease.

It is important to emphasize that involvement of the suboccipital,postauricular,and cervical lymph nodes is not pathognomonic for rubella. Lymphadenopathy is associated with diseases such as measles,chickenpox,adenovirus infections,and infectious mononucleosis as well as with many others.

Exanthem. The rash,particularly in children,may be the first obvious indication of illness. It appears first on the face and then spreads downward rapidly to the neck,arms, trunk,and extremities. The eruption appears,spreads,and disappears more quickly than does the rash of measles. By the end of the first day,the entire body may be covered with the discrete pink-red maculopapules. On the second day,the rash begins to disappear from the face and the lesions on the trunk may coalesce to form a uniform red blush that may resemble the rash of mild scarlet fever. The lesions on the extremities,however,