Paediatrica Indonesiana 22 : 99 — 103. May — June 1982.

ORIGINAL ARTICLE

The Results of the Complement Fixation Test on the Cytomegalovirus Antibodies in Children Admitted to the Gadjah Mada University, Yogyakarta

by

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Abstract

The results of the Complement Fixation Test on the Cytomegalovirus (CMV) antibodies in 138 children admitted to the Gadjah Mada University Hospital revealed seropositive conversion as high as 56.6%. The percentage of seropositive was higher in older children. This investigation suggested that seroconversion in adults might play a role in CMV infection during child bearing period.

Received December 11, 1981.

Introduction

In general Cytomegalovirus (CMV) infection in children and adults causes mild symptoms as fever, skin rash, polyarthritis migrans, not excluding however pneumonia which may cause death (Krugman and Ward, 1968; Hanshaw, 1979).

Newborns with CMV infection may eventually suffer jaundice, petechiae, chorioretinitis, hepatomegaly, splenomegaly, microcephaly, brain calcification and mental retardation.

Reports from abroad show that this CMV infection commonly exists all over the continent, but so far there is no such report from Indonesia.

During the last four years in the Child Health Department of the Gadjah Mada University Hospital, Yogyakarta, only one case suspected as congenital CMV infection was found. This was the reason why the authors were interested in knowing more about the risk of CMV infection in the community, especially in expecting mothers in Yogyakarta.

In March 1977 blood samples were sent to the Institute of Child Health in London under the program of morbilli virus investigation which
mic proportion at that time in some region in Indonesia and caused death among many children.

It was quite an opportunity for the authors to have the Complement Fixation Test of the CMV antibody done in London.

The results were expected to yield confirmation whether the patients had ever been infected by the virus CMV antigen before.

Material and methods

Half a milliliter of blood was taken from the vena cubiti of children admitted to the Child Health Department of the Gadjah Mada University Hospital during March 1977.

The blood serum was separated and kept in the deep freezer and then sent to the Institute of Child Health, London, by Dr. John E. Rohde, the Rockefeller Foundation Representative
yakarta — Indonesia, still in a cold condition.

The results from London were stated as positive or negative. It was called positive when haemolysis occurred in the sensitized red blood cells and negative when there was no haemolysis.

Results

During one month 138 blood samples from 67 female and 71 male children, aged between 1 - 12 years, were collected. All the cases generally suffered from fever over 38° C.

Table 1 is the result of the Complement Fixation Test showing an average percentage of seropositive conversion of 56.5%, whereas for children of 5 - 9 years 52.5% which is higher than that in USA (Rowe et al., 1965), but still below that in Tanzania (Krocht and Jung, 1974).

Table 2 shows the main diagnosis of the patients from whom the blood sam-

ples were taken. The greatest number of cases was dengue fever (66 cases), typhoid fever (22 cases) and hepatitis (13 cases).

Furthermore unspecified fever (6 cases) and two cases of leukemia which have been treated with cytostatic drug regimen should be taken into account.

Discussion

CMV infection is probably caused by direct contact: people with low socio-economic status have seropositive conversion more often because of overcrowdedness and bad sanitation (Gold and Nankervis, 1974).

The virus excretion of the CMV cases may last for five months and may give rise to latent infection which migrated in leucocyte cell bodies (Lang and Noren, 1968).

Patients with viremia may excreted viruses in their urine (viruria), tears, saliva, vagina (Gold and Nankervis, 1974) and milk (Hays et al., 1972).

The signs and symptoms in congenital CMV infection are varied as shown in their reports as follows :

1. There is only one of twenty-one babies born of CMV infected mother who shows CMV infection symptoms (Starr and Gold, 1968).
2. There are nine among twelve babies born of CMV-infected mothers, who become mentally retarded later (Barenberg and Nankervis, 1970).
3. One among eight babies born of CMV-infected mothers, suffers brain calcification (Starr and Gold, 1968).
4. Among twenty-one babies with positive blood serum conversion, only one case suffers minimum brain damage (Melish and Hanshaw, 1973).
5. Only one of the twin (dizygous twin) shows CMV-infection symptoms and dies very soon, while his sibling is entirely unaffected (shearer et al., 1965).

Commenting on all the facts cited above, we assume that the length of infection time probably plays a role in the affected fetus, as Monif et al. stated (1972) and it has yet to be proved, if this means an existing "Immunological tolerance".

In children of 5 - 14 years of age in Tanzania, the percentage of seropositive conversion is 100%, while our investigation in Indonesia shows only 62.6%. Children of 5 - 9 years of age in Washington showed 33% seropositive conversion and ours was as high as 52.5%.

CMV infection spreads very rapidly in the neighbourhood of low socio-economical society because bad sanitary conditions and overcrowdedness may give rise to frequent direct contact among the CMV infected people (Gold and Nankervis, 1974). Obviously this issue cannot be ignored in Indonesia.

Table 3 shows that the older the child the more seropositive conversion occurs. Whether this may protect childbearing age mothers needs to be proven in fur-

ther investigation in the Indonesian community.

As can be seen in table 2 the virus diseases indeed play an important role (dengue fever, hepatitis). Also the non other wise specified (NOS) fever cases mentioned before are probably caused by the virus and the CMV infection can not be eliminated yet.

Virus infection as a possible cause of fever has to be recognized too, for which laboratory facilities are essential.

Leukemia as a blood disease also makes the affected children more susceptible to CMV infection, especially after treatment with cytostatic drug regimen, which usually escapes the physician's observation.

Conclusion

The writers conoluded that CMV infection was evident in Yogyakarta with probably high percentage of seropositive conversion in adults.

Further examination and investigation are considered important.

Acknowledgement

We would like to thank Dr. John E. Rohde who made this research in the Institute of Child Health, London, possible.

TABLE 1: *The results of the Complement Fixation Test in age groups stated below*

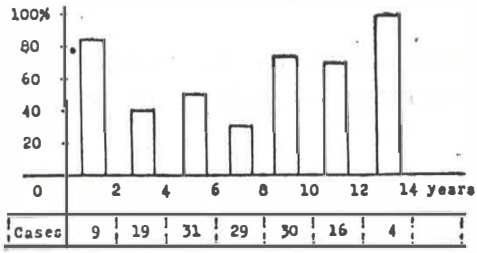
Age in years	Cases	Positive result	
		Cases	%
1 — 4	28	12	42.8
5 — 9	71	38	52.5
10 — 12	38	28	71.7
Total	138	78	56.5

TABLE 2: *The main diagnosis of the cases from which blood samples were taken*

No.	Name of disease	Cases	Positive result
1.	Dengue fever	66	26
2.	Typhoid fever	22	10
3.	Hepatitis	13	7
4.	Diarrhoea	9	3
5.	Pharyngitis	8	3
6.	Fever/NOS	6	5
7.	Primary tb	4	4
8.	Bronchitis	4	3
9.	Leukemia	2	1
10.	and Others	16	10
	T o t a l	138	78

Note: NOS = Non otherwise specified (ICD/WHO/1965).

TABLE 3 : *Seropositive conversion percentage based on CMV interval 1 - 14 years*



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