

Serum Immunoglobulin Levels in Infants
with and without Hepatitis B Virus Infection

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OBJECTIVES :

1. To determine the serum levels of IgM and IgG during the first year of life.
2. To determine if Hepatitis B virus (HBV) infection alters the serum immunoglobulin levels in infants.

BACKGROUND : Little information is available on IgM and IgG levels in Thai infants. No information exists on the effect of HBV infections on immunoglobulin levels of Thai infants. This investigation was incorporated into a larger study of the effects of HBV infections on Bangkok children during the first year of life.

DESCRIPTION : Serial serum samples were collected during the first year of life from infants of mothers who carried hepatitis B surface antigen (HB_sAg), antibody (anti-HB_s) or were negative at the time of delivery.

Serum samples were stored at -20°C until tested for HB_sAg and anti-HB_s by techniques previously described (1). Serum IgM and IgG levels were determined by testing all serum samples using commercial radial immunodiffusion kits (Hyland Laboratories). Questionable determinations were repeated on each individual simultaneously. For purposes of analysis, eight infants who developed HBV infections were compared to 21 infants who did not. All of the mothers of the eight infected infants were HB_sAg positive; the mothers of the non-infected infants included two with anti-HB_s (FM69, 535), five with HB_sAg (FM68, 487, 555, 573, 578) and 14 negatives.

PROGRESS : IgM and IgG concentrations for each age are shown in Tables 1 and 2, respectively. Although few infants had complete serum collections to test, there was a general trend toward rising IgM levels in both groups of infants during the first 33 weeks (Figure 1). IgG levels fell immediately after birth, then showed a progressive rise (Figure 2). The wide range of values in members of both study groups prevented the recognition of any difference between them due to infection with HBV.

SUMMARY : A small pilot study of serum IgM and IgG levels in Bangkok infants was completed. Combined data for all infants showed IgM levels rose progressively after birth as infant IgM production began. Serum IgG levels fell during the period when maternal antibody was declining but recovered as intrinsic IgG production increased. There was no discernible difference between eight infants with HBV infections and 15 non-infected infants.

REFERENCES :

1. Bancroft, W.H., Vanapruks, V., Scott, R.M., Chiwailp, D.: SEATO Medical Research Laboratory Annual Progress Report, March 1975.

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Table 1. Serum IgM Levels (mg%) During the First Year of Life

Infant Group		Age in Weeks					
		Birth	4 - 10	11 - 19	22 - 33	36 - 42	48 - 52
HBV Infected	Mean	9.5	90	157	132	123	128
	S.D.	3.2	51	76	39	48	11
	S.E.	1.1	23	27	15	21	8
	N.	8	5	8	7	5	2
Non-infected	Mean	11.9	93	113	149	159	267
	S.D.	5.5	74	70	58	62	99
	S.E.	1.3	18	16	14	22	44
	N.	19	17	20	17	8	5
Combined	Mean	11.2	92	126	144	145	227
	S.D.	5.0	69	73	53	58	106
	S.E.	1.0	15	14	11	16	40
	N.	27	22	28	24	13	7

Table 2. Serum IgG Levels (mg%) During the First Year of Life

Infant Group		Age in Weeks					
		Birth	4 - 10	11 - 19	22 - 33	36 - 42	48 - 52
HBV Infected	Mean	1344	660	771	809	1249	1255
	S.D.	384	138	419	387	824	629
	S.E.	157	69	171	158	412	445
	N.	6	4	6	6	4	2
Non-infected	Mean	1143	785	857	867	998	1465
	S.D.	536	323	375	313	303	365
	S.E.	130	81	86	81	107	163
	N.	17	16	19	15	8	5
Combined	Mean	1195	760	836	850	1081	1405
	S.D.	501	296	379	327	509	407
	S.E.	104	66	76	71	147	154
	N.	23	20	25	21	12	7

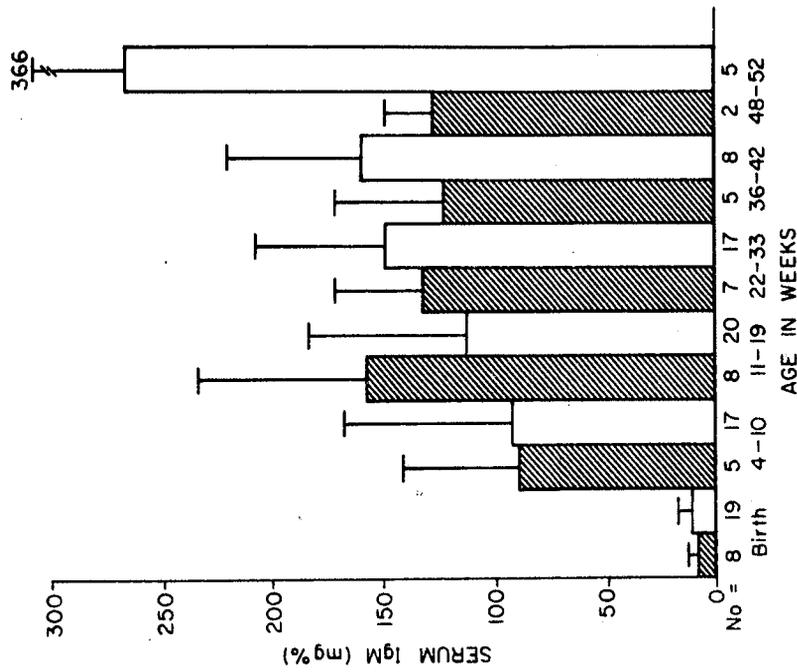


Figure 1 Serum IgM levels during the first year of life. One standard deviation indicated. Crosshatched bars represent infants infected with hepatitis B virus before the age of 36 weeks. Open bars are non-infected infants.

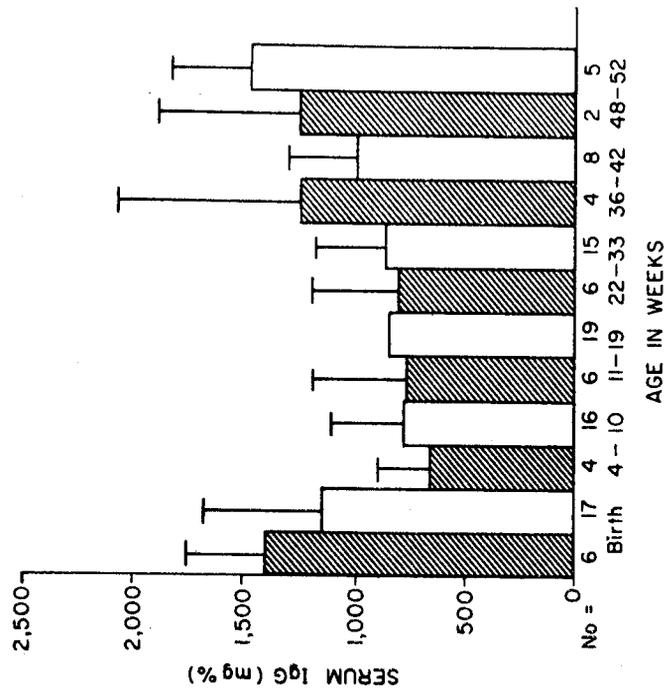


Figure 2. Serum IgG levels during the first year of life. One standard deviation indicated. Crosshatched bars represent children infected with hepatitis B virus before the age of 36 weeks. Open bars represent non-infected infants.