Plasma immunoglobulin concentrations in mothers and newborn children with special reference to placental malaria

Studies in the Gambia, Nigeria, and Switzerland *

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The immunoglobulin levels in sera from mothers and newborn infants were studied in Gambian, Nigerian, and Swiss populations. The maternal levels of IgG and IgM, but not IgA, varied with locality. As they were highest in Gambian and lowest in Swiss women, they may have reflected differences in the endemicity of infectious diseases in the different environments. The neonatal Ig levels showed less variation than the maternal. Neither maternal nor neonatal levels of IgG showed any consistent relationship with birthweight; however, when maternal IgG levels were low the neonatal levels tended to exceed them. The mean IgG and IgM levels were higher in Gambian than in Nigerian or Swiss infants; the higher IgM values may have been due to more frequent antigenic stimulation in utero in the Gambian group. Evidence of placental malaria, mainly falciparum, was found in 76 of 234 Gambian women. No parasites were found in the blood from any neonate. The maternal levels of IgG, but not of IgM or IgA, were significantly elevated in association with placental malaria. The neonatal immunoglobulin levels were not influenced by placental malaria and no evidence was found to indicate that malaria infection of the placenta induced an immune response in the fetus.

It is a remarkable fact that congenital malaria is virtually unknown in the regions of the world where malaria is hyperendemic, despite frequent heavy parasitization of placental blood (4). Although some parasites may on occasion enter the fetal circulation, no infection seems to follow. Intrauterine infections with a variety of viral and bacterial agents may lead to the premature synthesis of IgM and IgA by fetuses so that abnormal quantities of these proteins may appear in the serum of newborn babies (23). Malaria in young African children is known to be associated with increased concentrations of IgM (13), and studies in the USA have shown that experimental first infections in adult volunteers caused major increases of IgA and IgM (1). Thus an immune response of the fetus to the malaria parasite might also be expected to produce an increased concentration of IgM and possibly also of IgA in the serum of newborn individuals.

This study was undertaken primarily to assess the Ig levels in the serum of newborn babies in relation to malaria infection of the mother and to placental parasitaemia. The opportunity was also taken to compare neonatal and maternal immunoglobulin concentrations in populations residing in different geographic areas and to relate the IgG levels to placental weight and birthweight. The evidence for associating placental malaria with a low birthweight will be reported elsewhere.

The concentrations of IgG, IgA, and IgM in the
Materia... mothers and their newborn children from the Gambia, Nigeria, and Switzerland were compared. Malaria is endemic in the Gambia and all films of maternal and neonatal peripheral blood and also of maternal placental blood were routinely examined for the presence of parasites. The Nigerian samples were from Ibadan, where studies on malaria have previously been carried out (7), but the donors in this group were not examined for the parasite. Nor were parasitologic studies carried out on blood samples from Swiss mothers and children.

MATERIALS AND METHODS

In the Gambia

The mothers and babies were examined soon after delivery at the Royal Victoria Hospital, Banjul, or at one of several maternal and child welfare centres (MCWC) in the Kombo-St Mary District. According to their domicile they were allocated to one of 2 groups: Banjul or semirural. In the Banjul group were residents of the capital city, who had better access to medical facilities and were probably more free from endemic infections. The semirural group were not so fortunate in these respects, but were probably considerably better off than the primitive Gambian communities on whom previous Ig studies were carried out (13, 20).

The placentae were transported twice daily to our laboratories, after which a physician went to the places of delivery and examined and weighed both the mothers and the babies. These infants' weights are regarded in this paper as the weights at birth. Usually this examination took place within a few hours of birth and almost all were within 24 hours, but a few were carried out at 25–56 hours after birth. Subsequent analyses failed to show any correlation between the Ig levels of mothers and neonates and the time interval between delivery and the collection of plasma samples. In all, 234 mothers and their 242 children were studied in the period from September 1967 to May 1968.

Plasma was obtained from capillary blood samples and stored, after the addition of a trace of sodium azide, at -70°C. Blood films were prepared from maternal placental blood and from maternal and neonatal peripheral blood and stained by standard methods. The parasites in the peripheral blood were enumerated against white cell concentrations, and in the placental blood by assuming that 1 parasite per 100 oil-immersion fields represents a density of 10 parasites/mm³ blood. The placentae were weighed complete with membranes but washed clean of blood clots.

In Nigeria

The subjects were 35 mothers and their newborn infants delivered in University College Hospital, Ibadan. Maternal blood samples were collected postpartum by venepuncture, while neonatal serum was obtained from cord blood (by syringe) and from heelprick blood. Only IgA values were determined on the heelprick serum samples. In 2 cases, IgA was present in cord blood at one-third of the maternal level but was not detected in the heelprick sample, and it was assumed that the cord blood samples were probably contaminated by maternal blood. The results reported here are those for cord blood immunoglobulins excluding the 2 samples that may have been contaminated.

In Switzerland

The subjects were mothers and infants in the Department of Obstetrics, University of Lausanne. Blood samples were obtained from mothers by venepuncture and from neonates by syringe from cord blood. Maternal immunoglobulins and newborn IgG were measured on 41 paired maternal and neonatal samples. Neonatal IgA and IgM levels were measured on different cord blood samples collected from 100 unselected individuals in the same department.

Immunoglobulin measurements

The immunoglobulin concentrations of the Gambian and Lausanne serum samples were measured in Lausanne, the Gambian samples having been transported to Lausanne in vacuum flasks containing solid carbon dioxide. The single radial diffusion method described by Rowe et al. (20) was used with standards calibrated in international units per ml (26). For the measurement of IgA and IgM in newborn serum, the antisera were diluted to give maximum sensitivity; the limit of detectability was 1 IU/ml for IgA and 3 IU/ml for IgM. All neonatal and cord sera were tested for IgD by double diffusion in agar, but this immunoglobulin was not detected.

Similar techniques were employed at Ibadan, using a standard of pooled Nigerian serum calibrated in IU/ml.

The mean levels and standard deviations for the various groups are reported in IU/ml. Logarithmic transformation was found to stabilize the variances of the subgroups very effectively (particularly for IgM) and was used in statistical tests where necessary.
RESULTS

Immunoglobulin concentrations in the different groups

For brevity, the term serum is used in the remainder of this paper to describe both serum and plasma samples. Table 1 shows the results.

Maternal sera. The mean IgG levels were found to increase in the order Lausanne, Ibadan, Gambia (Banjul), and Gambia (semirural). The differences between the levels for any pair of the 4 groups was statistically significant at least at the 1% level.

The IgM levels were lowest in Lausanne, higher and nearly equal in Ibadan and Banjul, and highest in the Gambian (semirural) group which was significantly higher than all the other groups (P<0.01).

The mean IgA levels showed no major differences between the 4 population groups.

Neonatal sera. The IgG levels showed less variation between the 4 population groups than did maternal levels. No differences were seen between the Lausanne and Ibadan, or between the two Gambian groups, although the two latter had significantly higher means levels than the former (P<0.001).

The IgM levels were much lower than the corresponding maternal levels. As with IgG, no differences were detected between the Lausanne and Ibadan groups, or between the two Gambian groups, although the mean levels from Gambia were significantly higher than those in the other two groups (P<0.01).

Neonatal IgM levels above 20 mg/100 ml have been associated with intrauterine infections, and in one investigation in the USA 0.8% of 1768 cord blood samples tested exceeded this value (21). Because IgM levels reported from different laboratories are known to show considerable variations if they are expressed by weight, the use of international units has been proposed. For purposes of comparison, the IgM levels expressed here as IU/ml were therefore converted to mg/100 ml on the estimate that 1 IU corresponds to 8.47 μg, the 95% confidence interval being 6.99–10.1 μg (19). On this basis, 20 mg/100 ml IgM corresponds to 23.6 IU/ml, the 95% confidence interval being 19.8–28.6 IU/ml. Neonatal IgM levels above 23.6 IU/ml were found to be more frequent in the Gambian serum samples than in those from Lausanne and Ibadan, the proportions being 31%, 7% (7 samples), and 3% (1 sample) respectively.

The neonatal IgA levels were low. Of the entire Gambian group only 3 samples had levels greater than 2 IU/ml. The results were therefore analysed according to the detectability of this protein. IgA was then found to be present in 25% of the Lausanne sera, 3% of Ibadan sera (1 individual), and 46% of the Gambian serum samples. The end point of detectability was not considered to be comparable between these groups since the conditions of the test varied slightly. However, all the Gambian samples were tested under identical conditions in the same laboratory, and comparisons were considered to be valid. IgA was found in 49% of the Gambian (Banjul) and 43% of the Gambian (semirural) serum samples. These Gambian sera that were positive for IgA had also higher mean levels of IgM and IgG than did the IgA-negative sera (P<0.01).

Immunoglobulin concentrations in relation to malaria infection in Gambians

A total of 234 mothers and 242 children were examined. In no instance was parasitaemia detected in neonatal blood. Of the mothers, 65 had malaria parasites in the peripheral blood; in 64 P. falciparum was present and in 4 P. malariae as well. In 1 mother a large parasite, either P. vivax or P. ovale, occurred on its own. Placental blood showed parasites in 72 instances, P. falciparum occurring in 71 samples and in 2 P. malariae as well. The large parasite mentioned above was also found in the placenta unaccompanied by other species. A further 4 placental blood smears showed heavy deposits of malarial pigment but no parasites. These placentae were also considered as infected.

In view of the more frequent presence of parasites in placental than peripheral blood and the closer relationship of the placenta to the fetus, placental infection rather than peripheral parasitaemia was chosen as an indicator for comparing the Ig levels. Placental infection in the semirural group was found significantly more frequently (48.3%) and was heavier (62% showed more than 1000 parasites/mm² blood) than in the Banjul group (12.6% and 29% respectively).

In both groups (Table 1) the maternal IgG levels were significantly higher in association with placental parasitaemia (Banjul P<0.05; semirural P<0.001). The differences in maternal IgM levels in relation to placental malaria were not significant in either group. Further analyses showed that the maternal levels of both IgG and IgM were related to the degree of placental infection, heavy infections (parasite counts exceeding 1000/mm² blood) being more associated with higher immunoglobulin levels than lighter infections. In contrast, the maternal IgA levels showed no relationship to placental infection.
<table>
<thead>
<tr>
<th></th>
<th>Maternal</th>
<th>Neontal</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IgG</td>
<td>IgA</td>
<td>IgM</td>
<td>IgG</td>
<td>IgM (all samples)</td>
<td>IgM (IgA+)</td>
</tr>
<tr>
<td>Lausanne</td>
<td>106 ±19 (41)</td>
<td>103 ± 56 (41)</td>
<td>214 ± 138 (39)</td>
<td>164 ± 43 (41)</td>
<td>13 ± 7 (100)</td>
<td>—</td>
</tr>
<tr>
<td>Ibadan</td>
<td>158 ± 41 (35)</td>
<td>102 ± 37 (35)</td>
<td>264 ± 191 (35)</td>
<td>150 ± 37 (33)</td>
<td>10 ± 7 (28)</td>
<td>—</td>
</tr>
<tr>
<td>Banjul (all samples)</td>
<td>197 ± 71 (109)</td>
<td>125 ± 41 (107)</td>
<td>253 ± 141 (108)</td>
<td>214 ± 55 (111)</td>
<td>23 ± 15 (107)</td>
<td>28 ± 20 (52)</td>
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<td>(pl+) b</td>
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<td>(pl+) b</td>
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<tr>
<td></td>
<td>253 ± 99 (14)</td>
<td>122 ± 39 (13)</td>
<td>262 ± 114 (14)</td>
<td>224 ± 37 (14)</td>
<td>20 ± 7 (13)</td>
<td>25 ± 10 (5)</td>
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<td>(pl-) b</td>
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<td>(pl-) b</td>
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<td></td>
<td>189 ± 62 (95)</td>
<td>126 ± 42 (94)</td>
<td>252 ± 145 (94)</td>
<td>213 ± 57 (97)</td>
<td>23 ± 16 (94)</td>
<td>28 ± 21 (47)</td>
</tr>
<tr>
<td>Semirural (all samples)</td>
<td>245 ± 69 (115)</td>
<td>127 ± 42 (114)</td>
<td>364 ± 209 (115)</td>
<td>218 ± 55 (116)</td>
<td>24 ± 21 (115)</td>
<td>32 ± 29 (49)</td>
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<td></td>
<td>275 ± 72 (59)</td>
<td>132 ± 42 (59)</td>
<td>390 ± 207 (59)</td>
<td>222 ± 57 (60)</td>
<td>25 ± 22 (59)</td>
<td>32 ± 29 (28)</td>
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<tr>
<td></td>
<td>214 ± 51 (56)</td>
<td>121 ± 42 (55)</td>
<td>337 ± 210 (56)</td>
<td>213 ± 53 (56)</td>
<td>23 ± 20 (56)</td>
<td>32 ± 31 (21)</td>
</tr>
<tr>
<td>Keneba d</td>
<td>263 (41)</td>
<td>126 (41)</td>
<td>311 (41)</td>
<td>340 (275)</td>
<td>145 (275)</td>
<td>388 (275)</td>
</tr>
</tbody>
</table>

a IgA+ and IgA− indicate the presence or absence respectively of detected IgA in neonatal samples.
b pl+ and pl− indicate the presence and absence respectively of placental parasitaemia.
c Data from surveys reported by McGregor et al. (13). Pregnant women were within 10 weeks of parturition; non-pregnant values were taken in March 1967.
The levels of IgG and IgM in neonatal sera did not vary with the degree of placental infection, nor did the frequency with which IgA was detected. Since it was possible that the transfer of maternal plasma across the placenta could have affected the IgM levels the results were further analysed by considering only those infants’ sera with no detectable IgA. The mean IgM levels of these sera also did not differ significantly in relation to placental parasitaemia.

**Correlation between maternal and newborn immunoglobulin levels**

The results (Table 1) show less variation in the IgG levels in neonatal sera than in maternal sera among the different populations. A corollary to this relative constancy between neonatal IgG levels is the observation that in the groups in which maternal IgG levels were low, e.g., in Lausanne, the neonatal levels tended to be higher than the maternal, whereas where maternal IgG levels were high, e.g., in the Gambia (semirural) group, the neonatal levels tended to be lower. The following are the numbers and proportions of serum samples in each population group in which the maternal IgG levels were less than, or equal to, the values in neonates: Lausanne 38 (93%), Ibadan 18 (55%), Gambia (Banjul) 74 (68%), and Gambia (semirural) 47 (41%). There was also evidence for relative constancy in neonatal IgG levels within all the population groups. In every group the frequency of pairs, in which the maternal level was less than that of the child, fell progressively as the maternal levels increased. Although in general, the neonatal levels were substantially independent of the maternal levels, a significant correlation of low order was apparent between maternal and newborn IgG levels within all groups, excluding Lausanne: i.e., Lausanne, \( r = 0.30, P < 0.10 \); Ibadan, \( r = 0.65, P < 0.01 \); Gambia (Banjul), \( r = 0.25, P < 0.01 \); Gambia (semirural), \( r = 0.33, P < 0.01 \).

The maternal and neonatal levels of IgM were found to be significantly correlated in the Gambian Banjul group (\( r = 0.23, P < 0.05 \)) but not in the semirural group (\( r = 0.10, P > 0.05 \)). For Ibadan mother/infant pairs, \( r = 0.22, P < 0.10 \); matched samples were not available in Lausanne.

The levels for IgA in both Banjul and semirural groups were associated in the sense that mothers with serum levels above average had a significantly higher proportion of IgA positive children compared with mothers with IgA levels below average.

**IgG concentrations in Gambians in relation to placental weight and birthweight**

The levels of IgG in mothers and infants are shown in Table 2 in relation to the placental weight, infant’s birthweight, and the maternal domicile. The mater-

### Table 2. Distribution of the mean serum IgG levels (IU/ml) in Gambian mothers and infants by placental weights and birthweights (numbers of subjects in parentheses)

<table>
<thead>
<tr>
<th>Placental weight (g)</th>
<th>Banjul mother</th>
<th>Banjul child</th>
<th>Semirural mother</th>
<th>Semirural child</th>
<th>Both groups mother</th>
<th>Both groups child</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt; 349</code></td>
<td>146 (1)</td>
<td>193 (1)</td>
<td>251 (5)</td>
<td>127 (5)</td>
<td>233 (6)</td>
<td>138 (6)</td>
</tr>
<tr>
<td><code>450–549</code></td>
<td>199 (34)</td>
<td>212 (34)</td>
<td>239 (44)</td>
<td>220 (44)</td>
<td>222 (78)</td>
<td>216 (78)</td>
</tr>
<tr>
<td><code>550–649</code></td>
<td>192 (38)</td>
<td>217 (38)</td>
<td>243 (29)</td>
<td>227 (29)</td>
<td>214 (67)</td>
<td>221 (67)</td>
</tr>
<tr>
<td><code>≥ 650</code></td>
<td>174 (11)</td>
<td>210 (11)</td>
<td>221 (12)</td>
<td>228 (12)</td>
<td>199 (23)</td>
<td>220 (23)</td>
</tr>
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<tr>
<th>Birthweight (g)</th>
<th>Banjul mother</th>
<th>Banjul child</th>
<th>Semirural mother</th>
<th>Semirural child</th>
<th>Both groups mother</th>
<th>Both groups child</th>
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<tbody>
<tr>
<td><code>&lt; 2 000</code></td>
<td>135 (1)</td>
<td>89 (1)</td>
<td>228 (10)</td>
<td>147 (10)</td>
<td>219 (11)</td>
<td>142 (11)</td>
</tr>
<tr>
<td><code>2 000–2 499</code></td>
<td>215 (8)</td>
<td>202 (8)</td>
<td>298 (11)</td>
<td>232 (11)</td>
<td>263 (19)</td>
<td>220 (19)</td>
</tr>
<tr>
<td><code>2 500–2 999</code></td>
<td>214 (42)</td>
<td>229 (42)</td>
<td>257 (27)</td>
<td>238 (27)</td>
<td>230 (69)</td>
<td>232 (69)</td>
</tr>
<tr>
<td><code>3 000–3 499</code></td>
<td>181 (37)</td>
<td>214 (37)</td>
<td>237 (43)</td>
<td>217 (43)</td>
<td>211 (80)</td>
<td>216 (80)</td>
</tr>
<tr>
<td><code>≥ 3 500</code></td>
<td>187 (21)</td>
<td>202 (21)</td>
<td>231 (22)</td>
<td>228 (22)</td>
<td>209 (43)</td>
<td>215 (43)</td>
</tr>
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</table>
nal levels showed little relatedness to either birth or placental weight. The IgG levels in infants were low in the lowest category of birthweights and placental weights but showed virtually no difference in the other categories.

DISCUSSION

Immunoglobulin levels in different populations

In maternal sera, the mean levels of IgA showed no consistent variation with nationality, but the levels of IgG and IgM were lowest in the Swiss and highest in the Gambian women. Similar differences were apparent between the Gambian groups, mothers domiciled in Banjul showing lower IgG and IgM levels than their counterparts from the semirural area. These differences may be due to variation in the endemicity of infectious diseases in the different environments. It is probable that the Swiss environment was the most healthy, while the difference in the prevalence of malarial parasitaemia between women in the Banjul (12.6%) and semirural (48.3%) groups supports the view that communicable disease in the Gambia is less common in an urban environment. To test this association further, the Ig levels of the two Gambian groups were compared with those obtained from women living in the primitive rural village of Keneba where infectious disease is hyperendemic (13, 20). As it was previously shown that the serum Ig levels changed during pregnancy, data from women within 10 weeks of parturition were selected for comparison as well as data from nonpregnant women of child-bearing age (Table 1). The mean levels of IgG and IgM were lowest in the Banjul group and highest in the Keneba nonpregnant group. The IgA levels varied little but were highest in the Keneba nonpregnant group. The occurrence of high IgG and IgM levels in both pregnant and nonpregnant women in Keneba is in accord with the known high frequency of infection in that area. These observations demonstrate that in developing countries data collected in modern urban environments are not necessarily typical of the country as a whole.

In neonatal sera, the levels of IgG and IgM showed similar but less marked differences between the population groups compared with those found for maternal serum. The neonatal levels of IgM and IgA were far lower than the corresponding maternal levels (Table 1).

Significant low order correlations between maternal and neonatal Ig levels were noted for all 3 immunoglobulins. With IgG the relationship followed a similar pattern to that described by Michaux et al. (15), in that, at low levels of maternal IgG, the levels in infants were greater, while at high levels of maternal IgG the reverse was true. This relationship is seen in comparisons of the levels between the different groups of Table 1 and also within the groups. The results show also relatively more constant neonatal than maternal IgG levels. Further evaluation of this relationship will require the study of the subclasses of IgG, since the IgG 2 subclass occurs in slightly reduced concentration in Caucasian neonatal serum, and hence may be less readily transmitted across the placenta (9, 16). Our findings are, in general, consistent with Brambell's theory of placental transmission of IgG (2), in which the number of postulated cellular receptors available for this protein places a limit on the rate of transport. A significant correlation between the maternal and neonatal IgA and IgM levels, demonstrated in the Nigerian and Gambian samples of this study, does not appear previously to have been reported. It remains to be shown whether these results arise from incomplete placental impermeability to these proteins or whether antigenic stimuli common to both mother and fetus are responsible.

The mean IgM levels were higher in Gambian than in Nigerian or Swiss children. Why this is so is unknown but the reasons may include the increased frequency of intrauterine infections, exposure in utero to a greater variety of antigens, or a greater responsiveness of the immune system. Lechtig and Mata (11) have reported increased cord serum IgM values in groups of low socioeconomic class in Guatemala and Peru. Since Hardy et al. (8) have reported lower IgM levels in sera from Negro newborn babies than from Caucasian counterparts, it seems unlikely that the differences we have observed are due to racial characteristics.

An overestimation of IgM by the method of single radial diffusion would occur if a substantial proportion of IgM were in the form of IgM\(_s\), which has been reported to be present in cord serum (17). However, the fractionation of pooled cord serum from Swiss newborn babies on Sephadex G 200 failed to demonstrate more than trace amounts of IgM\(_s\); at least 90% of the immunoglobulin appeared in the void column and could therefore be assumed to be of the 19 S form. Further studies on neonatal African sera, including the measurement of IgM antibodies, the determination of the molecular size of IgM, and the clinical assessment of infection in newborn babies are required in order to answer questions raised by this study.
PLASMA IMMUNOGLOBULIN CONCENTRATIONS

**Immunoglobulin levels in Gambians in relation to parasitaemia and to protection against malaria**

The levels of IgG, but not of IgM or IgA, were significantly raised in sera from Gambian mothers whose placentae were parasitized or showed signs of recent parasitization. These findings accord with earlier observations (13). However, placental malaria did not appear to influence the Ig levels in neonatal serum.

No case of congenital malaria was diagnosed during the study and parasites were never seen in neonatal blood despite frequent, often dense, placental infection. Nor was there an immune response by the fetus as evidenced by an increase in IgM or IgA in neonatal serum. The parasites and malaria antigens may have failed to cross the placenta or, alternatively, the IgG antibodies transplacentally acquired from the mother may have prevented them from initiating an immune response, as has been described for other antigens by Smith & Eitzman (22) and by Uhr & Möller (25). The latter explanation is probably more likely since specific malaria antibodies are readily demonstrable in the sera of neonates born in hyperendemic areas (12), and since IgG antibodies protective against malaria are present in immune adult sera (3) and in the cord serum of infants born from immune mothers (6). A protective role for malaria antibody is also suggested by the fact that although congenital malaria is rare in infants born in hyperendemic areas, it occurs not infrequently in the children of infected mothers who have recently arrived in malarious areas or who have lived in malaria-free regions for some years prior to childbirth (4, 5, 14).

**IgG, birthweight, and placental weight**

Thom et al. (24) found that the levels of IgG in sera from healthy newborn infants correlated directly with birthweight. On the other hand, Hobbs & Davis (10) observed that they were more clearly influenced by gestational age. In neither maternal nor neonatal sera from our Gambian series did we find any consistent relationship between the IgG levels and birthweight. A very low mean IgG level, however, occurred in infants of the lowest birthweight. Similarly, maternal and infant IgG levels did not change consistently with placental weight although, again, infants born with the smallest placentae possessed a low mean level. While it is possible that the infants in the lowest birth and placental weight categories represented the most premature infants in this study, there is no precise information regarding gestational age. Nevertheless, the findings here indicate that whatever may be the mechanism of the prenatal transfer of IgG from the mother to the child it is largely independent of placental size.

**ACKNOWLEDGEMENTS**

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**RÉSUMÉ**

**CONCENTRATIONS PLASMATIQUES D’IMMUNOGLOBULINES CHEZ DES MÈRES ET DES NOUVEAU-NÉS, EN PARTICULIER EN CAS DE PALUDISME PLACENTAIRE: ÉTUDES EFFECTUÉES EN GAMBIE, AU NIGÉRIA ET EN SUISSE**

On a recherché les taux d’IgG, d’IgA et d’IgM dans le plasma ou le sérum de mères et de nouveau-nés dans des populations de Gambie, du Nigéria et de Suisse. Les taux maternels d’IgA étaient du même ordre dans les différentes localités étudiées, tandis que les taux d’IgG et d’IgM étaient plus élevés au Nigéria qu’en Suisse, et plus élevés encore en Gambie. Les taux néonatals d’IgG et d’IgM présentaient moins de variations que les taux maternels; ils étaient peu différents en Suisse et au Nigéria, mais plus élevés en Gambie. Les taux néonatals d’IgG tendaient à être supérieurs aux teneurs du plasma maternel en cette immunoglobuline lorsque celles-ci étaient faibles, comme en Suisse, et à leur être inférieurs lorsqu’elles étaient élevées, comme dans les populations semi-rurales de Gambie.

Chez les mères de Gambie, les taux d’IgG, mais non
ceux d'IgM ou d'IgA, étaient significativement plus élevés en cas de paludisme placentaire. Par contre, l'infection du placenta n'avait aucune influence sur les taux néonatals d'IgG, d'IgM et d'IgA, et on n'a obtenu aucune preuve du rôle du paludisme placentaire dans la production d'une réponse immunitaire chez le fœtus.

On n'a relevé aucune corrélation constante entre les taux maternels et néonatals d'IgG et le poids à la naissance ou le poids du placenta. Cependant, en cas de faible poids à la naissance ou de faible poids du placenta, les taux néonatals moyens d'IgG étaient peu élevés.

REFERENCES