

# CHANGES IN THE LEVEL OF IMMUNOGLOBULINS IN THE DANZIG QUINTUPLETS IN THEIR FIRST YEAR OF LIFE

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*The level of immunoglobulins G, A, and M, were determined in the Danzig quintuplets using the method of single radial diffusion in the 5th, 6th, and 16th month of life. The IgG, IgM, and IgA level increased more slowly than in full-term healthy infants, but in the second year of life the level of IgG and IgM in the quintuplets corresponded already to normal values. The highest of IgG and IgM levels at the age of 16 months were found in the child with the lowest birth weight and in the children with most severe pneumonia in their first year of life.*

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The studies on the changes in the level of class G, M, and A immunoglobulins in the blood serum of the Danzig quintuples have been carried out by the radial diffusion method according to Mancini et al. (1965). Additionally, the immunoelectrophoretic analysis of sera diluted at 1:1, 1:4, and 1:8, was used as a tentative semiquantitative method. Both kinds of analysis were carried out after the conclusion of the 5th, 6th, and 16th month of life.

Apart from the above, after the conclusion of 6, 10, 12, and 16 months of life, the protein level in blood serum was determined and paper electrophoresis was carried out, paying attention to the gamma fraction, composed of IgG and part of IgA, and the beta fraction containing, i.a., IgA and IgM.

The determinations of IgG, IgM, and IgA, according to the radial diffusion method, were performed in the 5th and 6th month of life using antisera and standards of the the Sevac (Czechoslovakia) enterprise; they were also performed in the 16th month of life using ready-made sets of immunodiffusion Hyland plates and standards of the same company. The standards of the two companies were checked by standard sera with contents of IgG, IgM, and IgA, exactly determined by the Immunopathology Department of the State Institute of Hygiene in Warsaw. The immunoelectrophoretic analyses were performed by means of polyvalent horse serum directed against human-serum proteins for immunoelectrophoresis made by the Warsaw Producing Plant of Sera and Vaccines.

The results of the radial diffusion method are shown in Tables 1 and 2, and those of paper electrophoresis in Table 3.

The IgG, IgM, and IgA level, after the 5th and 6th month of life, were the same in all infants. They amounted respectively to 250, 30, and 30 mg/100 ml of serum and were

Table 1. *Changes in the Level of Immunoglobulins in the Quintuplets in Their First Year of Life (mg/100 ml)*

	5th month	6th month	16 months (mean)
IgG	250	250	800
IgM	30	30	85
IgA	30	30	below 50

somewhat below the norms adopted by Buckley and listed graphically by Mackiewicz (1971), Maszewska-Kusniarz (1972), and others.

After 16 months of life, the individual level of IgG, amounting to 750 in four children, and to 900 in the fifth one (i.e., in the mean 800 mg/100 ml), might be already admitted to be normal for this age, although these levels still amounted to approximately 1000 mg IgG/100 ml of serum, i.e., only 75-90% of the normal value of adults.

The IgM levels after the conclusion of the 16th month of life, which amounted to 70-100 mg/100 ml (85 in the mean), almost corresponded to the normal value of adults, amounting to approximately 90/100 ml; these IgM levels, more than IgG ones, exceeded the normal values for the given age.

Antibodies of the IgA type increased at the slowest pace in the quintuplets. In the 16th month of life the level of these immunoglobulins, below 50 mg/100 ml, did not yet reach the normal values adopted for that age, amounting to 60 mg/100 ml according to Buckley (see Mackiewicz 1971) or to 90 mg/100 ml according to Maszewska-Kusniarz (1972). The results of electrophoretic and immunoelectrophoretic analyses confirm the data obtained by the radial diffusion method.

It was noteworthy that, even in the 16th month of life, the percentage of gamma-globulins was much lower (12-16%) than the normal values for adults (19% + 2), whereas the beta-globulins corresponded to adult standards (10%).

In immunoelectrophoretic analyses, immunoglobulin G was detected — in the 5th, 6th, and 16th month of life — in all dilutions of the sera, but IgM was found only in

Table 2. *Levels of Immunoglobulins in the Quintuplets in the 16th Month of Life (mg/100 ml of serum)*

	IgG	IgM	IgA
Ewa	750	70	
Agnieszka	750	100	the most
Piotr	750	70	below 50
Adam	750	100	the least
Roman	900	90	

Table 3. *Percentage of Beta- and Gamma-Globulins in the Proteinograms of the Danzig Quintuplets*

	After 6 months		After 10 months		After 12 months		After 16 months	
	$\beta$	$\gamma$	$\beta$	$\gamma$	$\beta$	$\gamma$	$\beta$	$\gamma$
Ewa	14.1	17.1	11.5	14.7	11.2	14.6	9.2	12.8
Agnieszka	10.4	14.1	12.5	17.0	12.3	13.5	10.5	14.5
Piotr	15.0	13.7	11.0	14.8	8.8	15.7	11.5	15.7
Adam	11.3	15.3	10.3	13.5	11.3	14.6	10.4	12.8
Roman	11.5	16.8	9.9	13.5	12.1	16.8	10.4	14.6

1:1 and 1:4 dilutions in the 16th month of life. No precipitation line of IgA was found; this agrees with the very low levels of this immunoglobulin found by the authors in immunodiffusion analyses.

#### CONCLUSIONS

1. The IgG and IgM level in the quintuplets increased in the first year of life more slowly than in full-term healthy infants, whereas in the second year of life it corresponded to normal values.
2. The IgA level increased very slowly in the quintuplets and even at the age of 16 months it had not attained the normal value for that age.
3. The highest IgG and IgM levels at the age of 16 months were found in the child with the lowest birth weight (Roman) and in the children who had been most severely ill with pneumonia in their first year of life.