

Observations on a of the influence of on reticulocyte maturation based

by Otto Petrowicz

A general practitioners' preliminary report has found an association between reticulocyte maturation and mobile radio exposure in 1014 analyses performed over a time period of two years. Blood samples were taken from patients by different physicians before and after switching on newly deployed base stations and examined by several laboratories.

Using fluorescence technology, the number of reticulocytes was determined, as well as the decrease in basophilic granulocytes (white blood cells) HFR, MFR and LFR, due to reticulocyte maturation (beginning of maturation: HFR = high fluorescent reticulocyte, MFR = middle fluorescent reticulocyte, and 4 days later LFR = low ...). In addition, mean hemoglobin concentration (MCHC) was documented.

Reticulocytes are young erythrocytes (red blood cells) at the transition between normoblasts and matured erythrocytes. In children, standard ranges are dependent on age, as can be seen in table 1.

For adults, the normal range of reticulocyte counts is with 5 to 20%.

The mean hemoglobin concentration MCHC can be estimated either from the quotients from hemoglobin/hematocrit, or for the mean hemoglobin content of single erythrocytes/mean single cell volume. Table 1 shows the normal ranges for men and women resp. ranges dependent on age.

The study claims that reticulocyte counts prior to and after mobile phone use was 8.7% and 8.97%; the MCHC decreases slightly from 33 g/dl (=deciliter) to 31 g/dl.

As a measurement error occurring during determination has to be considered, there is no relevant difference between values detected before and after mobile radio use. The values may vary within this range, e.g. at repeated measurements made in identical volunteer.

preliminary evaluation mobile radio exposure on approximately 1000 analyses

The study's authors come to the same conclusions but point out that reticulocyte and MCHC values even vary in single persons and that variations may go up or down. However, these so-called intraindividual variations obviously are within normal ranges.

Variations that are not caused by a lack of accuracy of measurement methods, are physiological and can have various reasons. So e.g. erythropoiesis (blood formation), and thus reticulocyte counts, are stimulated by blood loss during menstruation. Other reasons for variations are e.g. different intakes of vitamins and iron depending on nutrition.

A scientific study aimed at finding a correlation between blood formation and mobile radio use has to consider various parameters of blood formation and of the examined collective. It is not sufficient to select two values only (MCHC and reticulocytes) and neglect all others parameters of blood formation. Moreover, such studies have to comply with a number of conditions, such as controlled design, guaranteeing data quality and other things.

Quality of data and their presentation are insufficient in this analysis. This is made especially clear by the fact that there were obviously blood coagulation problems in blood samples taken from children.

In summary, this preliminary evaluation cannot be accepted, since it does not comply with presently valid scientific standards. It does not give evidence of effects from extremely low pulsed GSM base station fields on the two determination parameters. The attempt made by the involved practitioners to derive an association with GSM field exposure from single results or results obtained from subgroups is highly dubious.

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Table 1: Reticulocytes (from a count of 1000 erythrocytes) in children

Age	mean value	s	95 %-margin	literature
Premature births, < 48 Std.	54	19	-	18
Ordinary births, < 48 Std.	47	19	-	18
1-24 Day	39.2	-	-	15
1.-7. Day	22.3	-	-	15
7.-10. Day	10.6	-	-	15
10.-30. Day	7.9	3.8	0.3-15.5	15
1.-2. month	12.9	7.4	0-27.7	15
2.-6. month	10.6	7.1	0-24.8	15
6.-12. month	7.5	4.9	0-17.3	15
1 st year	7.5	4.4	0-16.3	15
2 nd year	7.1	4.0	0-15.1	15
3 rd year	7.2	4.1	0-15.4	15
4 th year	8.1	5.0	0-18.1	15
5 th year	8.2	4.5	0-17.2	15
6 th year	7.5	4.0	0-15.5	15
7 th year	7.6	3.5	0.6-14.6	15
8 th year	6.8	3.2	0.4-13.2	15
9 th year	7.5	3.3	0.9-14.1	15
10 th year	7.6	3.2	1.2-14.0	15
11 th -15 th year	7.4	4.0	0-15.4	15

Taken from: Wissenschaftliche Tabellen Geigy: CIBA-GEIGY AG Basel, 1979, S. 191.

MCHC (middle corpuscular Hb concentration in g/dl)

Target group	adults	newly borns	3 months	1 year	8 year
men	31,4 – 36, 3	32 - 35	32 - 34	28 – 31	27 - 29
women	31,4 – 36, 3				

Taken from: M. Jakob: Normalwerte pocket – Das Vademecum kurz und bündig. In: Die Deutsche Bibliothek – CIP Einheitsaufnahme. Börm Bruckmeier Verlag, 2000, Grünwald.