Nordic Laboratories

PATIENT:	**Sample Report**			TEST REF:	**TST-NL-XXXXX**
TEST NUMBER:	T-NL-xxxxxx	COLLECTED:	dd-mm-yyyy	PRACTITIONER:	**Nordic Laboratories ApS**
GENDER:	M/F	RECEIVED:	dd-mm-yyyy		
AGE:	XX	TESTED:	dd-mm-yyyy		

TEST NAME: Packed Red Blood Cell (RBC) Elements

Toxic & Essential Elements; Packed Red Blood Cells

ESSENTIAL AND OTHER ELEMENTS		RESULT / UNIT		REFERENCE INTERVAL	PERCENTILE 2.5th 16th 50th 84th 97.5th
Calcium	(Ca)	**18**	µg/g	8-26	
Magnesium	(Mg)	**44**	µg/g	39-59	
Potassium	(K)	**87**	mEq/L	78-97	
Phosphorus	(P)	**562**	µg/g	520-670	
Copper	(Cu)	**0.731**	µg/g	0.52-0.8	
Zinc	(Zn)	**11.1**	µg/g	7.8-13.8	
Iron	(Fe)	**844**	µg/g	800-1010	
Manganese	(Mn)	**0.026**	µg/g	0.009-0.033	
Selenium	(Se)	**0.144**	µg/g	0.16-0.49	
Boron	(B)	**0.044**	µg/g	0.01-0.11	
Molybdenum	(Mo)	**0.0004**	µg/g	0.0002-0.001	

TOXIC METALS		RESULT / UNIT		REFERENCE INTERVAL	PERCENTILE 95th 99th
Arsenic	(As)	**0.0018**	µg/g	< 0.008	
Cadmium	(Cd)	**0.0008**	µg/g	< 0.002	
Cesium	(Cs)	**0.0086**	µg/g	< 0.015	
Chromium	(Cr)	**0.0002**	µg/g	< 0.0005	
Lead	(Pb)	**0.009**	µg/g	< 0.05	
Mercury	(Hg)	**0.0078**	µg/g	< 0.01	
Thallium	(Tl)	**< 0.00004**	µg/g	< 0.00005	

SPECIMEN DATA	
Comments:	
Date Collected: **05/20/2024**	Methodology: **ICP-MS**
Date Received: **05/24/2024**	
Date Reported: **05/28/2024**	

Nordic Laboratories Aps
Nygade 6, 3.sal • 1164 Copenhagen K • Denmark
Tlf. +45 33 75 10 00

UK Office:
11 Old Factory Buildings • Stonegate • E. Sussex TN5 7DU • UK
Tel: +44 (0)1580 201 687

www.nordic-labs.com
info@nordic-labs.com

TEST NAME: Packed Red Blood Cell (RBC) Elements

PACKED BLOOD CELL ELEMENTS REPORT

INTRODUCTION

This analysis of elements in packed blood cells was performed by ICP-Mass Spectroscopy following acid digestion of the specimen in a closed microwave system. For a given element, these procedures measure the sum of the amounts of surface-adhering and intracellular content, regardless of chemical form. For units of measurement, mg/l is approximately equivalent to ppm, and mcg/l is approximately equivalent to ppb.

The packed cells are not washed, and therefore, a very small amount of residual plasma remains as part of the specimen. Washing would eliminate some important plasma membranebound elements. Because the cells are not washed, the DDI reference range may vary from published ranges for intracellular content of washed erythrocytes. Blood cell specimens that are not adequately centrifuged, per the kit instructions, may yield distorted or invalid results because of excess plasma content.

Packed blood cell analysis is intended to be a diagnostic method of assessing insufficiency or excess of elements that have important functions inside blood cells or on blood cell membranes. Additional testing of whole blood or serum/plasma or other body tissues may be necessary for differential diagnosis of imbalances. Additional testing also may be necessary to assess specific dysfunctions of assimilation, transport, retention, or excretion of elements. Packed blood cell element analysis is additionally intended to determine elevated or excessive levels of five potentially toxic elements that can accumulate in erythrocytes: thallium, arsenic, cadmium, lead, and mercury.

If an element is sufficiently abnormal per the blood cell measurement, a descriptive text is included with the report. For elements with essential or beneficial functions, a text will print if the measured result is below -1.5 standard deviations from the mean of the reference population, or if the result is above +1.5 standard deviations from the mean of the reference population. For potentially toxic elements, a text prints whenever the measured result exceeds the expected range. If no descriptive element texts follow this introductory discussion, then all essential cell elements were measured to be within +1.5 SD, and all measured potentially toxic elements were within expected ranges.

Doctor's Data states the reference range as +1 SD from the mean of the reference population. This is considered to be the nutritionally and physiologically optimal range for elements with essential or beneficial functions. Physiological imbalance corresponds to levels beyond +1 SD but pathological consequences are not expected until the blood level is beyond +2 SD. Element levels beyond +2 SD may only be temporary nutritional problems or they may reflect a failure of homeostasis to control blood quantities. Pathological consequences depend upon cell and tissue functions which are disrupted by such levels.

SELENIUM LOW

Selenium (Se) has two documented functions as an enzyme activator in humans: (1) activation of the enzyme T4 to T3 prohormone deiodinase for balance in thyroid hormone level, and (2) activation of glutathione peroxidase for reduction of peroxides by oxidation of glutathione. Erythrocytes are a tissue of choice for assessing glutathione peroxidase function and selenium status. In its antioxidant function, selenium works with vitamin E. Vitamin E functions to prevent oxidation of cell membranes and fatty acids, while glutathione, via the peroxidase enzyme, works to undo oxidation after it has happened.

Nordic Laboratories Aps
Nygade 6, 3.sal • 1164 Copenhagen K • Denmark
Tlf. +45 33 75 10 00

UK Office:
11 Old Factory Buildings • Stonegate • E. Sussex TN5 7DU • UK
Tel: +44 (0)1580 201 687

www.nordic-labs.com
info@nordic-labs.com

TEST NAME: Packed Red Blood Cell (RBC) Elements

Symptoms and conditions that can result from Se deficiency include: increased susceptibility to viral infections, increased inflammation during infection or following exposure to xenobiotics or oxidant chemicals, hardening or sclerosing of tissue, muscle pain and tenderness, and possibly hypothyroid function with subnormal T3.

Selenium deficiency usually is the result of a poor quality diet or one which has emphasized highly refined foods. However, there are geographical regions in the world where the soil contains little Se, and even unprocessed food grown in such soils can be deficient in Se. Selenium often is lost through urinary wasting in cystinuria; hyperaminoaciduria conditions and renal transport disorders may feature Se wasting.

Laboratory tests for further assessment of Se status are: determination of erythrocyte glutathione peroxidase functional activity, measurement of serum T3 and T4, and measurement of hair Se level (barring exogenous Se contamination primarily from shampoos). 24-hour urine amino acid analysis may be informative if Se wasting is suspected.

BIBLIOGRAPHY FOR BLOOD CELL SELENIUM, LOW

1. Paglia D.E. et al, ”Studies on the Quantitative and Qualitative Characterization of Erythrocyte Glutathione Peroxidase”. J. Lab andClin Med 70(1), 1967 pp 158-69.

2. Rotruck J.T. et al, ”Selenium: Biochemical Role as a Component of Glutathione Peroxidase” Science 179, Feb 1973 pp 588-90.

3. Dhur A. et al, ”Relationship between Selenium, Immunity and Resistance against Infection” Comp. Biochem. Physiol. 966(2), 1990pp 271-80.
4. Tarp U. ”Selenium and the Selenium-Dependent Glutathione Peroxidase in Rheumatoid Arthritis” Danish Medical Bulletin, 41(3), 1994pp 264-74.
5. Berry M.J. et al ”Type I Iodothyronine Deiodinase Is a Seleno-cysteine-Containing Enzyme” Nature 349, Jan 1991.6. Harper H.A. et al, Review of Physiological Chemistry 17th ed, Lange Med Pub, Los Altos CA, 1979 pp 592-93.

Nordic Laboratories Aps
Nygade 6, 3.sal • 1164 Copenhagen K • Denmark
Tlf. +45 33 75 10 00

UK Office:
11 Old Factory Buildings • Stonegate • E. Sussex TN5 7DU • UK
Tel: +44 (0)1580 201 687

www.nordic-labs.com
info@nordic-labs.com