Clin. Lab. 2021;67:1-3

ORIGINAL ARTICLE

Elemental Concentration in the Biological Samples of Pakistani Male Breast Cancer Patients

Hassan I. Afridi, Ghulam Q. Chanihoon, Tasneem G. Kazi, Farah N. Talpur, Jameel A. Baig, Ghulam M. Channa

National Center of Excellence in Analytical Chemistry, University of Sindh, Jamshoro, Pakistan

SUMMARY

Background: **Breast cancer is an uncommon (rare) disease in men, approximately 1% of the total breast cancer cases in the world. By reason of the rare occurrence, there is no clinical or hospital study giving the information about the essential trace and toxic elements in the biological samples of male breast cancer patients.**
Methods: **The aim of current study was to estimate association among essential trace {zinc (Zn), iron (Fe) and copper (Cu)} and toxic {cadmium (Cd) and lead (Pb)} elements in human biological samples particularly blood, serum, scalp hair, of male breast cancer patients (n = 14, age range 52 - 58 years) residents of Hyderabad, Pakistan. For comparative purposes, the biological samples of referent persons (n = 37) of the same age groups were also be analyzed. Microwave oven mediated digestion method was employed, and digestion of samples was carried out with the help of 2:1 mixture solution of HNO_3 (65%) and H_2O_2 (30%). Atomic absorption spectrometry was employed for the determination of elemental concentrations from the microwave oven employed digested samples.**
Results: **The found average of essential elements (zinc, iron, and copper) in samples of male breast cancer patients was found to be lower, while cadmium and nickel were found to be higher, when compared with samples from referents ($p < 0.001$).**
Conclusions: **These data will be helpful for treatment of male breast cancer patients to improve his health and life.**
(Clin. Lab. 2021;67:xx-xx. DOI: 10.7754/Clin.Lab.2021.201223)

Correspondence:
Hassan Imran Afridi
National Center of Excellence in
Analytical Chemistry
University of Sindh
Jamshoro 76080
Pakistan
Phone: +92 0222-771379
Fax: +92 0221-771560
Email: hassanimranafridi@yahoo.com

Manuscript accepted February 26, 2021

Supplementary Tables and Figures

Supplementary Table. Linear regression and Pearson's coefficient for trace elements (Cu, Fe and Zn) versus different biochemical parameters in referents and male breast cancer patients.

Age groups	Elements	Biochemical parameters	Referents	Breast cancer patients
Scalp hair	Zn	Hb	y = 0.1374x - 13.295 r = 0.87	y = 0.0188x + 6.9442 r = 0.11
		RBC	y = 0.0387x - 3.3774 r =0.91	y = -0.0217x + 4.8484 r = 0.10
		WBC	y = 0.1743x - 27.927 r = 0.91	y = 0.0162x + 12.122 r = 0.24
		Platelets	y = 2.6957x - 224.99 r = 0.86	y = 0.8797x + 20.734 r = 0.21
		SGPT	y = 0.2361x - 26.602 r = 0.86	y = -0.4882x + 111.38 r = 0.26
	Fe	Hb	y = 0.3228x + 4.2781 r = 0.89	y = -0.063x + 9.6413 r = 0.23
		RBC	y = 0.0808x + 1.9078 r = 0.83	y = 0.0401x + 2.2898 r = 0.13
		WBC	y = 0.3441x - 3.428 r = 0.78	y = 0.0166x + 13.247 r = 0.16
		Platelets	y = 5.7901x + 138.11 r = 0.80	y = -0.7197x + 109.15 r = 0.11
		SGPT	y = 0.5313x + 4.3845 r = 0.79	y = -0.7226x + 81.254 r = 0.25
	Cu	Hb	y = -0.8569x + 27.331 r = 0.82	y = -0.1892x + 9.973 r = 0.11
		RBC	y = 0.2269x + 1.4166 r = 0.81	y = 0.5975x - 1.4416 r = 0.29
		WBC	y = -1.0082x + 22.492 r = 0.79	y = 0.1011x + 12.781 r = 0.15
		Platelets	y = 16.491x + 99.6 r = 0.79	y = -5.6638x + 138.79 r = 0.14
		SGPT	y = 1.5833x - 0.1444 r = 0.81	y = -2.766x + 89.464 r = 0.15
Blood	Zn	Hb	y = 3.2424x - 5.9187 r = 0.91	y = 0.7724x + 6.5589 r = 0.12
		RBC	y = 0.8304x - 0.7664 r = 0.86	y = 1.3614x - 0.5902 r = 0.18
		WBC	y = 3.9034x - 17.206 r = 0.89	y = 0.3421x + 12.634 r = 0.14
		Platelets	y = 61.488x - 66.454 r = 0.86	y = -11.315x + 126.57 r = 0.08
		SGPT	y = 42.887x - 247.93 r = 0.78	y = 12.987x + 35.121 r = 0.19
	Fe	Hb	y = 0.0516x - 10.424 r = 0.83	y = -0.0041x + 9.5913 r = 0.12
		RBC	y = 0.0131x - 1.8422 r = 0.78	y = 0.0103x + 0.4126 r = 0.26
		WBC	y = 0.0598x - 21.465 r = 0.79	y = 0.003x + 12.791 r = 0.23
		Platelets	y = 0.9963x - 160.46 r = 0.80	y = 0.2142x + 43.676 r = 0.28
		SGPT	y = 0.7318x - 331.81 r = 0.77	y = 0.0574x + 54.762 r = 0.16

Supplementary Table. Linear regression and Pearson's coefficient for trace elements (Cu, Fe and Zn) versus different biochemical parameters in referents and male breast cancer patients (continued).

Age groups	Elements	Biochemical parameters	Referents	Breast cancer patients
Blood	Cu	Hb	y = 17.635x - 2.959 r = 0.78	y = 0.9789x + 8.1564 r = 0.11
		RBC	y = 5.2538x - 0.7667 r = 0.86	y = -1.1199x + 3.4483 r = 0.12
		WBC	y = 23.165x - 15.632 r = 0.84	y = 0.553x + 13.29 r = 0.16
		Platelets	y = 376.68x - 53.766 r = 0.83	y = -58.176x + 122 r = 0.29
		SGPT	y = 270.35x - 246.91 r = 0.78	y = -11.948x + 74.189 r = 0.13
Serum	Zn	Hb	y = 7.236x + 7.9196 r = 0.89	y = -0.9022x + 8.8873 r = 0.11
		RBC	y = 1.868x + 2.7627 r = 0.86	y = -1.7474x + 3.568 r = 0.18
		WBC	y = 8.2057x - 0.0393 r = 0.83	y = -0.7683x + 13.792 r = 0.24
		Platelets	y = 128.51x + 204.71 r = 079	y = -43.687x + 112.03 r = 0.23
		SGPT	y = 13.465x + 8.8166 r = 0.89	y = -11.363x + 72.963 r = 0.13
	Fe	Hb	y = 2.3427x + 6.9047 r = 0.84	y = 0.8182x + 7.1468 r = 0.28
		RBC	y = 0.634x + 2.3974 r = 0.84	y = -0.3231x + 3.5317 r = 0.09
		WBC	y = 2.9053x - 2.0681 r = 0.85	y = 0.2771x + 13.043 r = 0.25
		Platelets	y = 48.74x + 161.5 r = 0.87	y = 15.544x + 69.829 r = 0.23
		SGPT	y = 4.4287x + 6.6836 r = 0.85	y = 7.7324x + 55.538 r = 0.24
	Cu	Hb	y = -25.52x + 34.491 r = 0.81	y = -1.4223x + 9.0202 r = 0.17
		RBC	y = 7.1461x - 0.7733 r = 0.84	y = -2.8729x + 3.8622 r = 0.29
		WBC	y = 30.602x - 14.975 r = 0.79	y = 0.8944x + 13.249 r = 0.28
		Platelets	y = 503.28x - 47.373 r = 0.79	y = 51.391x + 80.988 r = 0.26
		SGPT	y = 51.926x - 16.986 r = 0.88	y = -19.079x + 74.999 r = 0.21