

RESULTS AND
ANALYSIS OF RESULTS

RESULTS
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Serum levels of the trace elements studied in this work (zinc, copper, chromium, cobalt, manganese and molybdenum), both of the normal children (controls) (group C) and of the children with different neoplastic diseases, are shown in tables 18 - 22. Tables 23 - 52 show the comparison between the mean values of the different groups. This comparison is also represented diagrammatically in figures 2 - 12.

Table (18) : Serum trace elements in
normal children (group C).

N ^a	Zn ug/dl	Cu ug/dl	Cr ng/ml	Co ug/ml	Mn ug/dl	Mo ng/dl
1	184	88	14.0	0.029	0.060	59
2	190	110	13.0	0.030	0.050	64
3	161	90	10.5	0.021	0.065	66
4	84	79	11.0	0.020	0.065	64
5	95	146	12.0	0.031	0.060	68
6	150	160	14.0	0.029	0.061	65
7	160	181	13.0	0.024	0.068	64
8	155	182	15.0	0.023	0.070	59
9	162	101	13.0	0.024	0.071	57
10	161	106	14.0	0.023	0.067	70
11	150	118	16.0	0.020	0.066	74
12	151	117	14.0	0.033	0.064	65
13	153	142	11.5	0.034	0.063	63
14	84	141	10.5	0.024	0.061	70
15	79	150	12.5	0.021	0.061	71
16	89	94	13.5	0.019	0.050	63
17	114	89	14.5	0.022	0.060	59
18	120	108	12.5	0.022	0.066	60
19	123	101	13.0	0.021	0.064	63
20	102	109	14.0	0.020	0.065	62
Mean	133.35	120.6	13.075	0.0245	0.0624	64.3
[†] S.D.	35.139	30.947	1.462	0.0047	0.00562	4.52

Table (19) Serum trace elements in
leukaemia (group I)

N ^a	Zn ug/dl	Cu ug/dl	Cr ng/	Co ug/	Mn ug/dl	Mo ng/dl
21	106	200	7.5	0.018	0.029	71
22	101	190	9.0	0.014	0.034	62
23	100	250	11.0	0.013	0.049	58
24	99	139	12.0	0.012	0.040	60
25	94	149	10.5	0.014	0.039	63
26	101	189	9.5	0.011	0.026	59
27	89	204	11.0	0.019	0.035	55
28	102	196	7.5	0.014	0.044	70
29	81	230	6.0	0.010	0.019	59
30	84	195	9.5	0.014	0.022	80
31	95	245	11.0	0.020	0.030	74
32	101	250	8.0	0.016	0.031	80
33	99	190	9.5	0.021	0.040	75
34	99	175	10.0	0.017	0.018	72
35	95	205	9.5	0.025	0.030	69
36	100	230	8.5	0.010	0.034	71
37	88	210	7.0	0.024	0.040	64
38	90	190	8.5	0.021	0.050	63
39	95	180	11.5	0.023	0.039	60
Mean	95.737	203.263	9.316	0.01663	0.0343	66.579
±S.D.	6.640	27.896	1.643	0.00474	0.00899	7.582

Table (20) : Serum trace elements in
brain tumours (group II)

N ^o	Zn ug/dl	Cu ug/dl	Cr ng/	Co ug/	Mn ug/dl	Mo ng/dl
40	90	140	12.0	0.013	0.040	49
41	124	211	10.0	0.016	0.030	63
42	95	259	11.5	0.020	0.050	90
43	90	165	7.0	0.015	0.055	60
44	106	148	7.5	0.020	0.040	64
45	78	188	8.5	0.022	0.040	61
46	83	194	7.0	0.015	0.030	58
47	93	215	10.0	0.015	0.035	60
48	88	242	7.5	0.017	0.027	69
49	98	198	8.0	0.020	0.035	55
50	117	165	7.5	0.025	0.050	53
51	89	240	8.5	0.020	0.045	54
52	84	114	11.0	0.024	0.045	61
53	101	250	11.0	0.015	0.030	60
54	105	179	11.0	0.015	0.034	60
55	81	176	8.0	0.023	0.037	54
Mean	95.125	192.75	9.125	0.0184	0.0389	60.688
±S.D.	12.858	41.794	1.756	0.00378	0.00825	9.207

Table (21) : Serum trace elements in lymphomas (group III)

N ^o	Zn ug/dl	Cu ug/dl	Cr ng/	Co ug/	Mn ug/dl	Mo ng/dl
56	140	160	10.0	0.017	0.041	59
57	101	210	8.0	0.026	0.030	63
58	93	174	8.0	0.013	0.040	51
59	84	155	10.0	0.024	0.031	64
60	94	195	8.5	0.020	0.029	60
61	96	159	11.0	0.019	0.021	61
62	105	165	9.5	0.013	0.014	62
63	119	210	9.0	0.020	0.044	63
64	106	219	10.0	0.016	0.045	59
65	84	189	11.5	0.020	0.030	74
66	89	149	10.0	0.021	0.021	77
67	101	170	12.0	0.018	0.028	75
68	100	201	12.0	0.020	0.030	85
69	94	201	9.5	0.020	0.029	60
70	100	195	7.8	0.017	0.031	57
71	100	209	7.0	0.022	0.025	61
72	91	184	10.0	0.012	0.035	50
73	79	150	6.5	0.011	0.020	54
74	90	120	8.0	0.013	0.034	59
75	84	185	7.0	0.015	0.020	80
76	101	219	11.0	0.015	0.051	69
77	100	180	9.5	0.017	0.050	54
78	91	200	11.5	0.013	0.030	64
79	85	117	12.0	0.023	0.032	57
80	105	215	10.5	0.024	0.033	70
Mean	97.28	181.24	9.592	0.01796	0.032	63.52
±S.D.	12.615	28.853	1.654	0.00417	0.00938	8.982

Table (22) : Serum trace elements in
other neoplasms (group IV)

N ^o	Zn ug/dl	Cu ug/dl	Cr ng/ml	Co ug/ml	Mn ug/dl	Mo ng/dl
81	79	160	9.0	0.020	0.040	67
82	87	210	7.5	0.014	0.019	70
83	101	156	9.0	0.018	0.023	80
84	103	154	11.0	0.014	0.039	54
85	69	209	10.0	0.025	0.042	56
86	99	195	8.5	0.019	0.019	79
87	88	177	9.0	0.017	0.021	59
88	108	235	7.5	0.019	0.050	54
89	94	205	9.5	0.017	0.021	64
90	130	154	8.5	0.019	0.040	70
91	91	149	8.5	0.023	0.049	60
92	88	165	8.0	0.019	0.033	70
93	86	180	6.5	0.014	0.040	60
94	119	200	11.0	0.030	0.032	56
95	102	194	10.0	0.019	0.015	60
96	83	192	9.0	0.017	0.050	58
97	84	123	8.0	0.019	0.019	69
98	84	214	9.5	0.017	0.035	60
99	99	235	11.0	0.012	0.017	63
100	80	155	8.0	0.016	0.039	62
Mean	93.7	183.1	8.95	0.0184	0.0322	63.55
+S.D.	14.364	30.558	1.234	0.00408	0.0119	7.529

Table (23) : Mean values of serum zinc
levels in different groups
compared to group (C) (controls)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
C	20	133.350	35.139	7.857		
I	19	97.737	6.640	1.523	- 4.6997	< 0.001 (V.H.S.)
II	16	95.125	12.858	3.214	- 4.5029	< 0.001 (V.H.S.)
III	25	97.280	12.615	2.523	- 4.3710	< 0.001 (V.H.S.)
IV	20	93.700	14.364	3.212	- 4.6710	< 0.001 (V.H.S.)

Table (24) : Mean values of serum zinc
levels in different groups
compared to group (I)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
I	19	95.737	6.640	1.523		
II	16	95.125	12.858	3.214	- 0.1721	> 0.7(N.S.)
III	25	97.280	12.615	2.523	- 0.5236	> 0.5(N.S.)
IV	20	93.700	14.364	3.212	- 0.5730	> 0.5(N.S.)

Table (25) : Mean values of serum zinc
levels in different groups
compared to group (II)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
II	16	95.125	12.858	3.214		
I	19	95.737	6.640	1.523	0.1721	>0.7(N.S.)
III	25	97.280	12.615	2.523	0.5274	>0.6(N.S.)
IV	20	93.700	14.364	3.212	-0.3136	>0.7(N.S.)

Table (26) : Mean values of serum zinc
levels in different groups
compared to group (III)

Gr.	No	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
III	25	97.280	12.615	2.523		
I	19	95.737	6.640	1.523	-0.5236	>0.5(N.S.)
II	16	95.125	12.858	3.214	-0.5247	>0.6(N.S.)
IV	20	93.700	14.364	3.212	-0.8765	>0.4(N.S.)

Table (27) : Mean values of serum zinc
levels in different groups
compared to group (IV)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
IV	20	93.700	14.364	3.212		
I	19	95.737	6.640	1.523	0.5730	> 0.5(N.S.)
II	16	95.125	12.858	3.214	0.3136	> 0.7(N.S.)
III	25	97.280	15.615	2.523	0.8765	> 0.4(N.S.)

Table (28) : Mean values of serum copper
levels in different groups
compared to group (C) (controls)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
C	20	120.6	30.947	6.920		
I	19	203.263	27.896	6.400	8.6798	< 0.001 (V.H.S.)
II	16	192.75	41.794	10.448	5.7570	< 0.001 (V.H.S.)
III	25	181.24	28.853	5.771	6.7299	< 0.001 (V.H.S.)
IV	20	183.1	30.558	6.833	6.4270	< 0.001 (V.H.S.)

Table (29) : Mean values of serum copper
levels in different groups
compared to group (I)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
I	19	203.263	27.896	6.400		
II	16	192.750	41.794	10.448	-0.8580	> 0.30(N.S.)
III	25	181.240	28.853	5.771	-2.556	< 0.02(M.S.)
IV	20	183.100	30.558	6.833	-2.1537	< 0.05(S.S.)

Table (32) : Mean values of serum copper
levels in different groups
compared to group (IV)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
IV	20	183.100	30.558	6.833		
I	19	203.263	27.896	6.400	2.1537	< 0.05 (S.S.)
II	16	192.750	41.794	10.448	0.773	> 0.04 (N.S.)
III	25	181.240	28.583	5.771	0.208	> 0.07 (N.S.)

Table (33) : Mean values of serum chromium
levels in different groups
compared to group (C) (controls)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
C	20	13.075	1.462	0.327		
I	19	9.316	1.643	0.377	-7.5320	< 0.001 (V.H.S.)
II	16	9.125	1.756	0.439	-7.2159	< 0.001 (V.H.S.)
III	25	9.592	1.654	0.331	-7.4857	< 0.001 (V.H.S.)
IV	20	8.950	1.234	0.276	-9.6400	< 0.001 (V.H.S.)

Table (34) : Mean values of serum chromium
levels in different groups
compared to group (I)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
I	19	9.316	1.643	0.377		
II	16	9.125	1.756	0.439	-0.3301	> 0.5 (N.S.)
III	25	9.592	1.654	0.331	0.5501	> 0.5 (N.S.)
IV	20	8.950	1.234	0.276	-0.7833	< 0.2 (N.S.)

Table (35) : Mean values of serum chromium
levels in different groups
compared to group (II)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
II	16	9.125	1.756	0.439		
I	19	9.316	1.643	0.377	0.3301	> 0.5 (N.S.)
III	25	9.592	1.654	0.331	0.8494	> 0.2 (N.S.)
IV	20	8.950	1.234	0.276	-0.3375	> 0.5 (N.S.)

Table (36) : Mean values of serum chromium
levels in different groups
compared to group (III)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
III	25	9.592	1.654	0.331		
I	19	9.316	1.643	0.377	-0.5501	> 0.5 (N.S.)
II	16	9.125	1.756	0.439	-0.8494	> 0.2 (N.S.)
IV	20	8.950	1.234	0.276	-1.4897	< 0.1 (N.S.)

Table (38) : Mean values of serum cobalt
levels in different groups
compared to group (C)(controls).

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
C	20	0.02450	0.00470	0.001050		
I	19	0.01663	0.00474	0.001090	-5.200	< 0.001(V.H.S.)
II	16	0.01840	0.00378	0.000944	-4.320	< 0.001(V.H.S.)
III	25	0.01796	0.00417	0.000834	-4.877	< 0.001(V.H.S.)
IV	20	0.01840	0.00408	0.000913	-4.384	< 0.001(V.H.S.)

Table (39) : Mean values of serum cobalt
levels in different groups
compared to group (I)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
I	19	0.01663	0.00474	0.001090		
II	16	0.01840	0.00374	0.000944	1.2275	> 0.2(N.S.)
III	25	0.01796	0.00417	0.000834	0.9690	> 0.3(N.S.)
IV	20	0.01840	0.00408	0.000913	1.2449	> 0.2(N.S.)

Table (40) : Mean values of serum cobalt
levels in different groups
compared to group (II)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
II	16	0.01840	0.00374	0.000944		
I	19	0.01663	0.00474	0.001090	-1.2275	> 0.2(N.S.)
III	25	0.01796	0.00417	0.000834	-0.3493	> 0.7(N.S.)
IV	20	0.01840	0.00408	0.000913	0.0000	> 0.7(N.S.)

Table (41) : Mean values of serum cobalt
levels in different groups
compared to group (III)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
III	25	0.01796	0.00417	0.000834		
I	19	0.01663	0.00474	0.001090	-0.9690	> 0.3(N.S.)
II	16	0.01840	0.00374	0.000944	0.3493	> 0.7(N.S.)
IV	20	0.01840	0.00408	0.000913	0.3560	> 0.7(N.S.)

Table (43) : Mean values of serum manganese
of different groups compared
to group (C) (controls)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
C	20	0.0624	0.00562	0.00126		
I	19	0.0343	0.00899	0.00206	-11.6366	< 0.001(V.H.S.)
II	16	0.0389	0.00825	0.00206	- 9.7317	< 0.001(V.H.S.)
III	25	0.0320	0.00938	0.00188	-13.4324	< 0.001(V.H.S.)
IV	20	0.0322	0.01190	0.00266	-10.2605	< 0.001(V.H.S.)

Table (44) : Mean values of serum manganese
of different groups compared
to group (I)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
I	19	0.0343	0.00899	0.00206		
II	16	0.0389	0.00825	0.00206	1.5790	> 0.1(N.S.)
III	25	0.0320	0.00938	0.00188	-0.8247	> 0.4(N.S.)
IV	20	0.0322	0.01190	0.00266	-0.6242	> 0.5(N.S.)

Table (45) : Mean values of serum manganese
levels in different groups
compared to group (II)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
II	16	0.0389	0.00825	0.00206		
I	19	0.0343	0.00899	0.00206	-1.5790	> 0.1(N.S.)
III	25	0.0320	0.00938	0.00188	-2.4741	< 0.02(M.S.)
IV	20	0.0322	0.01190	0.00266	-1.9914	> 0.05(N.S.)

Table (46) : Mean values of serum manganese
levels in different groups
compared to group (III)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
III	25	0.0320	0.00938	0.00188		
I	19	0.0343	0.00899	0.00206	0.8247	> 0.4(N.S.)
II	16	0.0389	0.00825	0.00206	2.4741	< 0.02(M.S.)
IV	20	0.0322	0.01190	0.00266	0.6614	> 0.5(N.S.)

Table (47) : Mean values of serum manganese
levels in different groups
compared to group (IV)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
IV	20	0.0322	0.01190	0.00266		
I	19	0.0343	0.00899	0.00206	0.6242	>0.5(N.S.)
II	16	0.0389	0.00825	0.00206	1.9914	>0.05(N.S.)
III	25	0.0320	0.00938	0.00188	-0.6614	>0.5(N.S.)

Table (48) : Mean values of serum molybdenum
levels in different groups
compared to group (C) (Controls).

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
C	20	64.300	4.520	1.011		
I	19	66.579	7.582	1.739	1.1330	> 0.1(N.S.)
II	16	60.688	9.207	2.302	-1.4366	> 0.05(N.S.)
III	25	63.520	8.982	1.796	-0.3785	> 0.5(N.S.)
IV	20	63.550	7.529	1.683	-0.3820	> 0.5(N.S.)

Table (49) : Mean values of serum molybdenum
levels in different groups
compared to group (I)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
I	19	66.579	7.582	1.739		
II	16	60.688	9.207	2.302	-2.0419	< 0.05(S.S.)
III	25	63.520	8.982	1.796	-1.2236	> 0.1(N.S.)
IV	20	63.550	7.529	1.683	-1.2516	> 0.1(N.S.)

Table (50) : Mean values of serum molybdenum
levels in different groups
compared to group (II)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
II	16	60.688	9.207	2.302		
I	19	66.579	7.582	1.739	2.0419	<0.05(S.S.)
III	25	63.520	8.982	1.796	0.9700	>0.15(N.S.)
IV	20	63.550	7.529	1.683	1.0036	>0.15(N.S.)

Table (51) : Mean values of serum molybdenum
levels in different groups
compared to group (III)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
III	25	63.520	8.982	1.796		
I	19	66.579	7.582	1.739	1.2236	>0.1(N.S.)
II	16	60.688	9.207	2.302	-0.9700	>0.15(N.S.)
IV	20	63.550	7.529	1.683	0.0122	>0.5(N.S.)

Table (52) : Mean values of serum molybdenum
levels in different groups
compared to group (IV)

Gr.	No.	Mean	$\pm$ S.D.	$\pm$ S.E.	t	p
IV	20	63.550	7.529	1.683		
I	19	66.579	7.582	1.739	1.2516	> 0.1(N.S.)
II	16	60.688	9.207	2.302	-1.0036	> 0.15(N.S.)
III	25	63.520	8.982	1.796	-0.0122	> 0.5(N.S.)

Fig. (3) : Mean values of serum
copper levels.

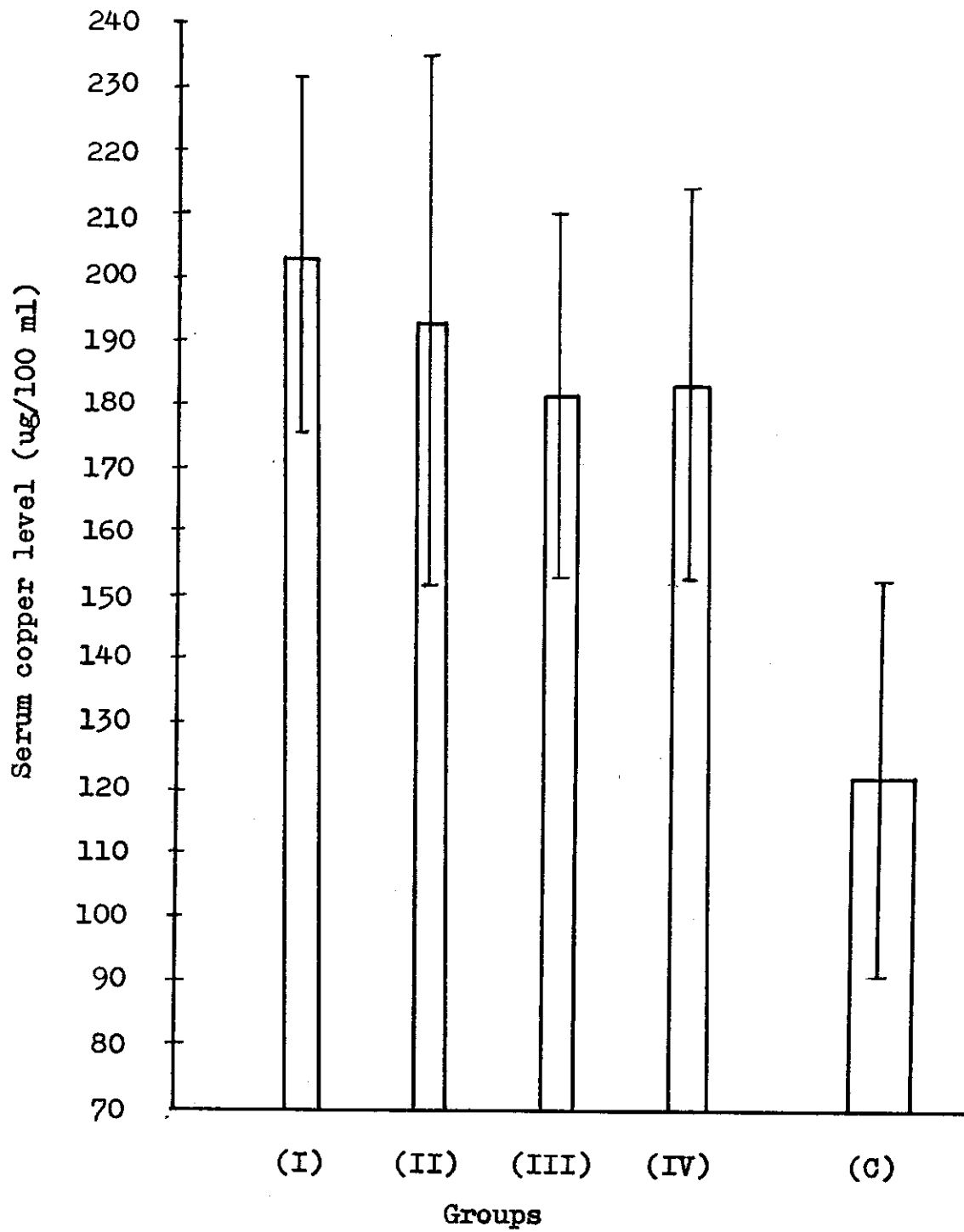


Fig (4) : Mean values of serum
chromium levels.

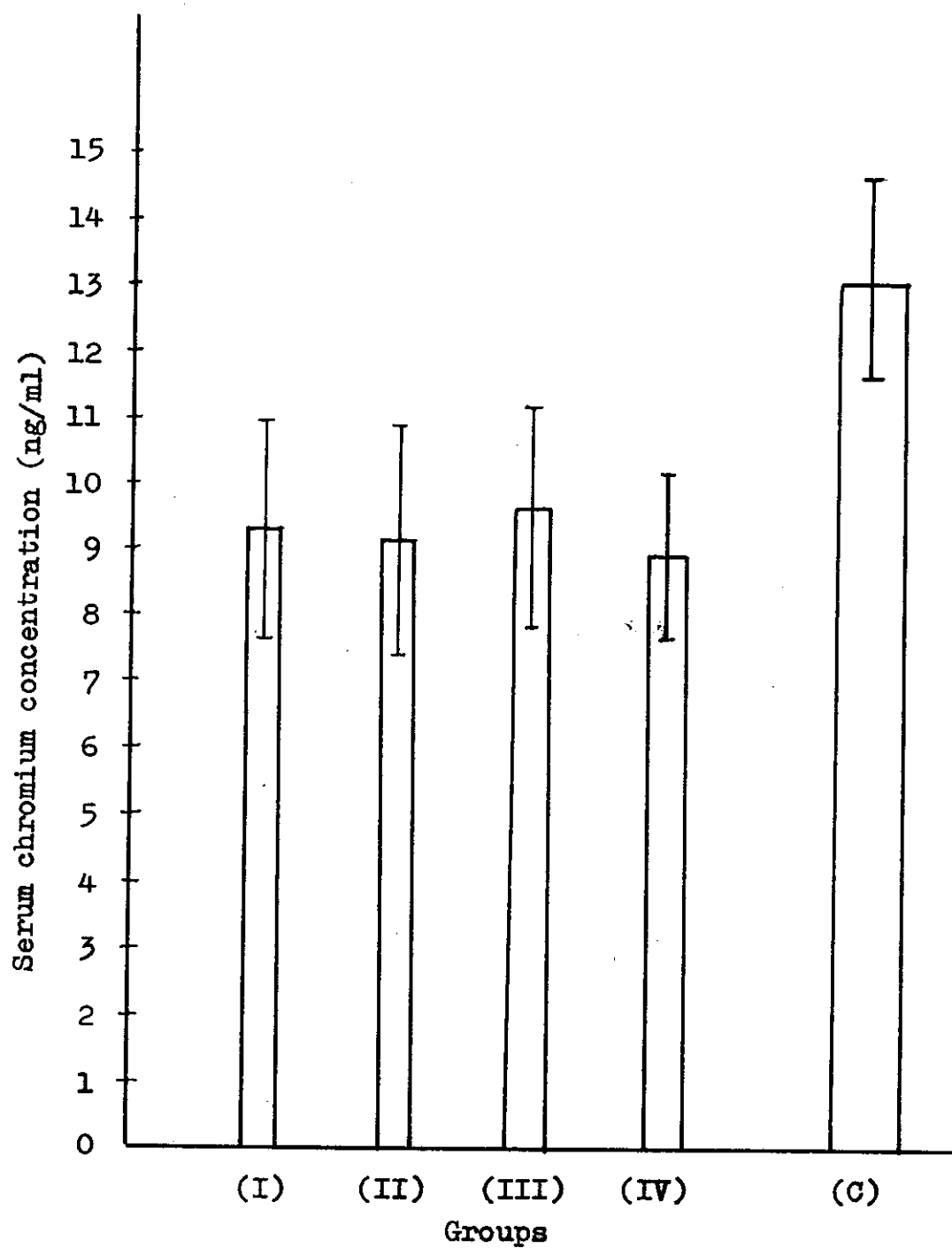


Fig (5) : Mean values of
serum cobalt levels.

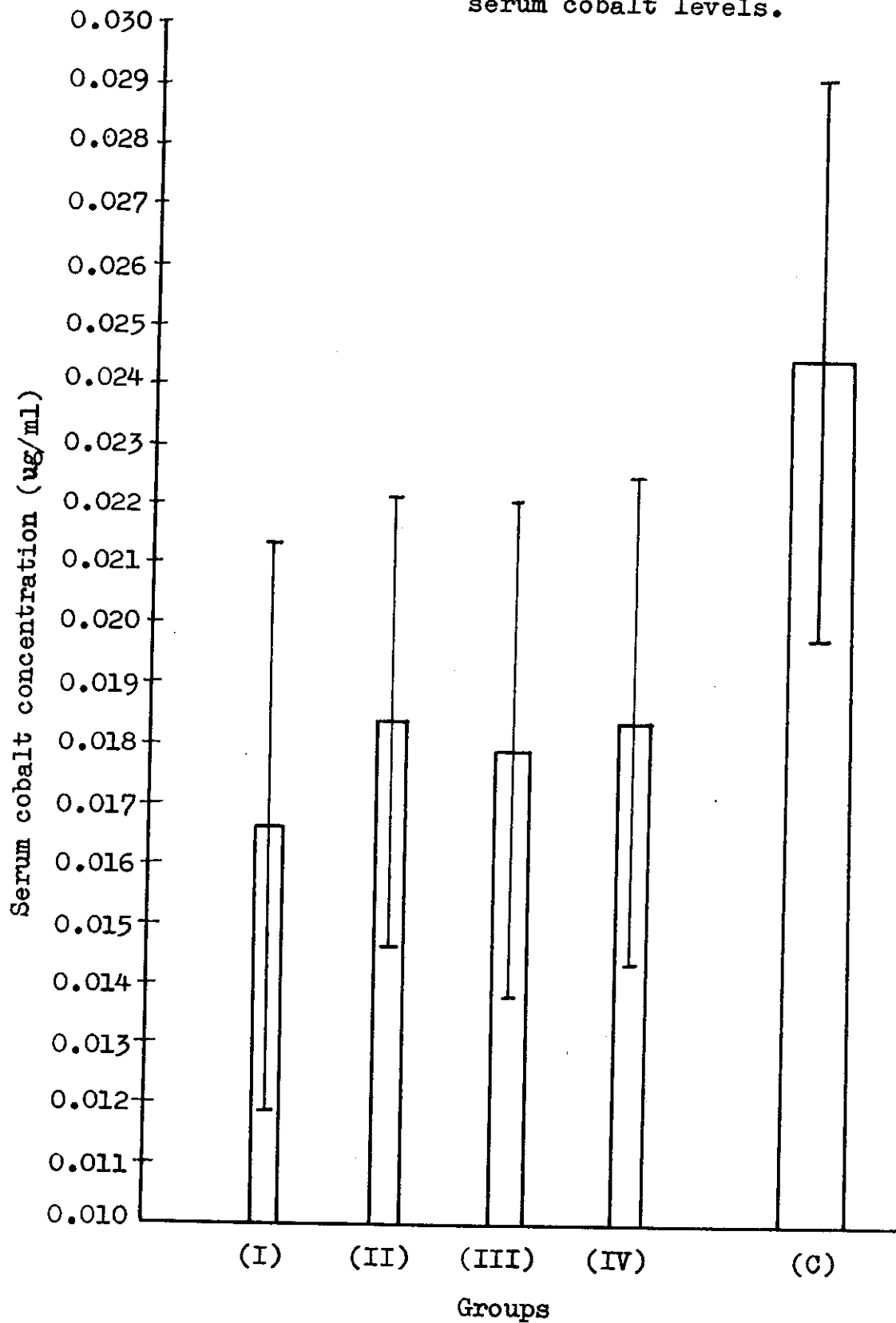


Fig (6) : Mean values of serum manganese levels.

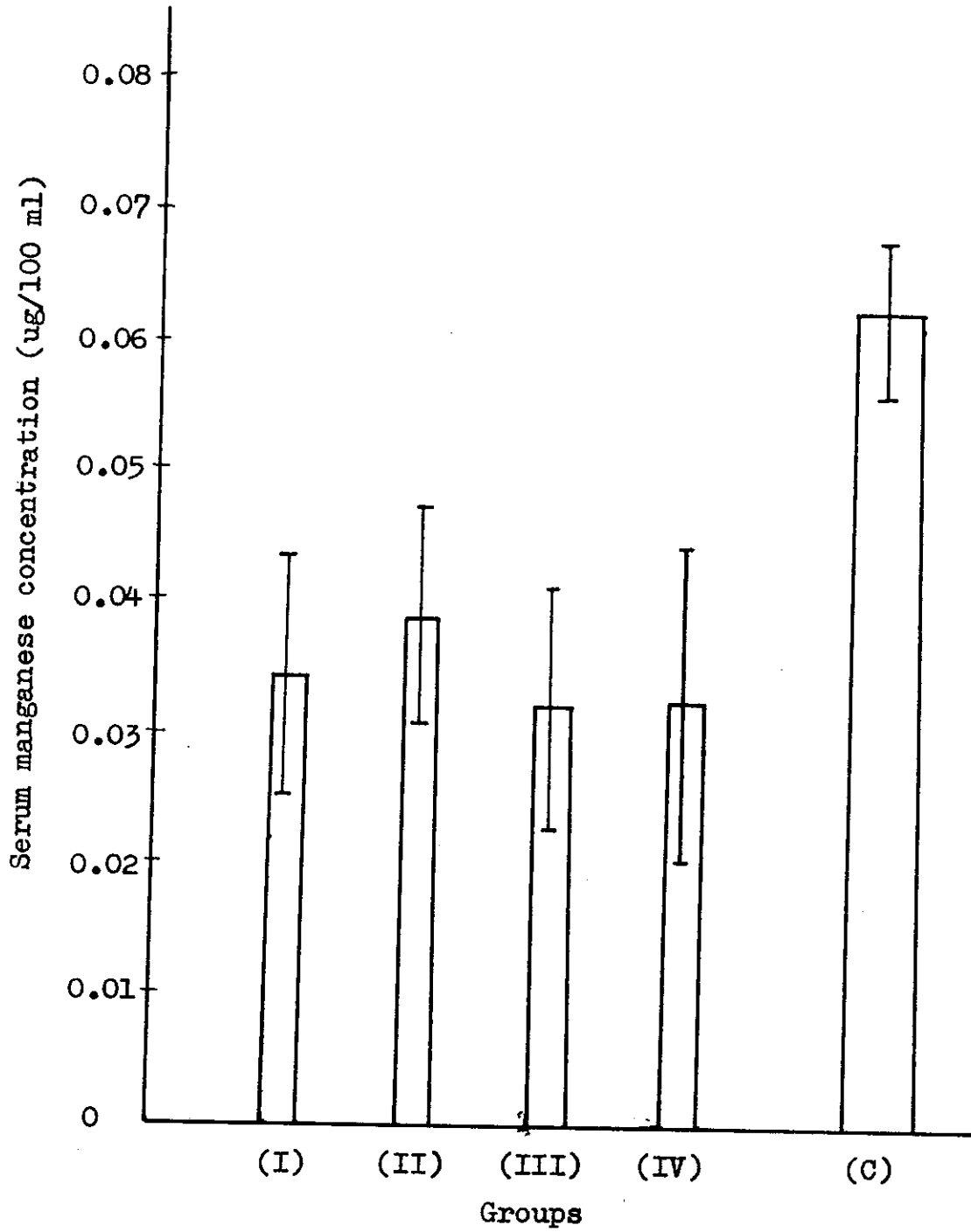


Fig (7) : Mean values of serum
molybdenum levels.

