

# Serum electrolytes in tribes of chikhaldhara region

Food & Diet



## **Serum Electrolytes Observed in Tribes of Chikhaldhara Region. Dist. Amravati (M. S.)**

- Ingole A. B.

### **Abstract:**

The present cross sectional study was undertaken among the tribale people of Chikhaldhara Region to estimate and compare some biochemical parameters such as Sodium and Potassium, concentration in different age groups of tribale Male and Female. Total 257 Males and 319 Females were taken for examination. Concentration of serum Sodium and Potassium were calculated by Female photometry (Kramer 1971) method. The test of statistical significant ( t Test) was used to compare population groups. The normal values of Sodium and Potassium, were not observed in studied.

### **Introduction:**

Human blood is composed of blood cells suspended in blood plasma and contains Proteins, Glucose, Mineral Iron, Harmones, Carbon dioxide plasma also sevens as the protein reserve of human body. It plays a vital role in an intravascular osmotic effect that keeps electrolytes in balanced form and protects the body form infection and other blood disorders (Maton et al 1993) (Jyothi et al 2012)

Sodium ions are necessary for regulation of blood and body fluids, transmission of nerve impulses, heart activity and certain metabolic functions (Kaur and Kochar 2009 and 2010). Sodium is an essential nutrient that regulates blood volume, blood pressure, osmotic equilibrium and PH. Sodium chloride is the principle source of sodium in the dite most of it comes

from processed foods. The adequate intake for sodium is 1.2 to 1.5 gons per day. Minimum amount that promotes hypertension (Geleijnse 2004).

Potassium is also an essential macromineral in human nutrition it is the major cation (positive ion) inside animal cells, and it is this important in maintain fluid and electrolyte balance in the body. Sodium makes up most of the cations of blood plasma at a reference range of about 145 mm<sup>0</sup>/L and potassium makes up most of the cell fluid cations at about 150 mm<sup>0</sup>/L. Plasma is filtered through the glomerulus of the kidneys in the enormous amounts, about 180 liters per day. (Potts et al 1964). Thus 602 g of sodium and 33g of potassium are filtered each day. 1-10 g of sodium and 1-4 g of potassium likely to be in the diet must be reabsorbed. Sodium must be reabsorbed in such a way as to keep the blood volume exactly right and the osmotic pressure correct, potassium must be reabsorbed in such a way to as to keep serum concentration as close as possible to 4.8 mm<sup>0</sup>/L (Kumar and Chaudhary 2010).

Sodium pumps in the kidneys must always operate to conserve sodium.

Potassium must sometimes be conserved also, but as amount of potassium in the blood plasma is very small and the pool of potassium in the cells is about thirty times as large, the situation is not so critical for potassium. Since potassium is moved passively (Beutler et al 2006). Potassium is secreted twice and reabsorbed three times before the urine reaches the collecting tubules (Wright 1977).

Hypokalemia is often without symptoms. Moderate hypokalemia with serum potassium concentrations of 2.5-3 mrg/L may cause muscle weakness,

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myalgia, and muscle cramps and constipation. With more severe hypokalemia flaccid paralysis (Goldman 1973). Extreme hyperkalemia is a medical emergency due to the risk of potentially fatal abnormal heart rhythms symptoms are fairly nonspecific and generally include malaise, palpitations and muscle weakness. The problem is detected during screening blood tests for a medical disorder, or it only comes to medical attention after complications have developed, such as cardiac arrhythmia or sudden death (Rao and Thunia 2004).

### **Material and Methods:**

The present cross sectional study was undertaken among the tribes of Chikhaldara Dist. Amravati to evaluate serum biochemical such as sodium and potassium concentration under the guidance of Doctor and medical technician. Blood samples were from tribes during the year 2011 to 2013. Analysis of serum biochemical sodium and potassium were carried out by Flame Photometry method by Kramer (1921). Age group wise distribution of tribes were done. The difference between different age group of tribe male and female were statistically analyzed by applying student t test.

### **Result and Discussion:**

#### **Comparative Sodium observed in tribal females and males**

During serum biochemical studies, the comparative sodium level in different age group of tribal females and males from Chikhaldara, Dist. Amravati (M. S.) was analyzed. The observed results of study are represented as below-

Table : Comparative Sodium observed in tribal females and males

Age Group Years	Female		Male					
	N	m	SD	N	m	SD		
0 - 5	18	136.	67	6.	202	12	136.	67
5 - 10	17	114.	12	39.	681	16	134.	75
10 - 15	39	126.	03	21.	173	19	135.	11
15 - 20	35	133.	03	11.	197	30	139.	23
20 - 25	63	132.	73	19.	846	57	140.	46
25 - 30	49	130.	59	18.	738	17	135.	35
30 - 35	21	132.	81	10.	279	15	138.	33

35 - 40	7	122. 29	8. 301	18	136. 22
40 - 45	19	131. 37	11. 987	14	134. 21
45 - 50	12	130. 75	14. 580	19	138. 37
50 - 55	15	130. 73	10. 361	10	131. 50
55 <	24	124. 79	17. 134	48	133. 90

Figure . Comparative Sodium observed in tribal females and males

Comparative Potassium observed in tribal females and males

During serum biochemical studies, the comparative potassium level in different age group of tribal females and males from Chikhaldara, Dist. Amravati (M. S.) was analyzed. The observed results of study are represented as below-

Table : Comparative Potassium observed in tribal females and males

Age Group	Femal e	Male
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Years

N	m	SD	N	m	SD
0 - 5	18	3.068	12	3.77	
5 - 10	17	3.46	16	4.03	
10 - 15	39	3.92	19	4.03	
15 - 20	35	3.71	30	3.96	
20 - 25	63	4.12	57	4.12	
25 - 30	49	4.16	17	3.85	
30 - 35	21	3.91	15	4.10	
35 - 40	7	4.00	18	4.27	
40 - 45	19	3.0	14	4.	

		91	830	23
45 - 50	12	3. 74	0. 654	4. 19 04
50 - 55	15	4. 45	0. 852	4. 10 02
55 <	24	4. 17	1. 206	3. 48 93

Results indicate that Serum sodium level was observed to be significantly different in females in all age groups. While in males of age group 10-15 and 50 above was observed to be significantly different at 0. 05.

Sodium alteration in all age groups suggest the future threats of sodium related disorders. According to Reynolds et al (2013) hypernatremia is an electrolyte disturbance that is defined by an elevated sodium level in the blood shows symptoms such as lethargy, weakness, irritability, neuromuscular excitability and edema severe symptoms are usually due to acute elevation of plasma sodium concentration to above 157 mg/L.

Androque et al (2000) suggests that dyponatremia can be flase or articial hyponatremia in which case there is no hypotonicity. In acute hyponatremia sodium (salt) level drop rapidly resulting in Potentially dangerous effects, such as brain swelling, which can result in coma and death. (Ayus and Moritz 2010).



In present study potassium alteration suggest future threats of potassium related disorders. According to Hodg Kin and Huxley (1952) Hyperkalemia develops when there is excessive production of or ineffective elimination of potassium. Ineffective elimination can be hormonal or due to causes in the renal parenchyma that impair excretion. Increased extracellular potassium level results in depolarization of membrane potentials of cells due to the increase in the equilibrium potential of potassium. This depolarization opens some voltage-gated sodium channels, but also increases the inactivation at the same time. Above a certain level of potassium the depolarization inactivated. Sodium channels, opens potassium channels, thus the cell become refractory. This leads to the impairment of neuromuscular cardiac, and gastrointestinal organ systems such a complication might occur in malnutrition status in tribes of present study area.

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