

# Assessment of Quantity of Salt Consumption among Hypertensive Patients in a Rural Set up of Thiruvallur District

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## Abstract:-

### ➤ Introduction

In India around 29.6% of the people are hypertensive. Hypertension is the direct cause for 57% of deaths due to stroke and 24% of deaths due to coronary artery disease in India. The association of salt intake and blood pressure is direct and continuous. A small reduction of 6 g in salt intake for 4 or more weeks decreases blood pressure by 7.11/3.88 mm Hg in hypertensive individuals.

### ➤ Aim & Objective

- To determine the quantity of dietary salt consumption among hypertensive patients.
- To assess the knowledge practice attitude towards salt consumption among hypertensive patients.

### ➤ Method & Material

A descriptive cross sectional study was conducted among patients who were diagnosed hypertensives according to the latest WHO guidelines. The sample size was 110. Patients with known electrolyte imbalance or kidney disorders will be excluded. Interview based questionnaire and spot urinalysis was done after getting informed consent. Study duration was from January to March 2019.

### ➤ Result

In the study 110 participants were included. The average amount of salt consumed by the people was 9.6g per day. Among the 110 participants 70 participants gave the urine sample and 40 denied. The results showed that average amount of sodium excreted is 168.83meq/l and potassium excreted is 68meq/l. 70 participants, 42 of them had urine sodium value more than 220 meq/l and 28 had the urine sodium value in the range of 40 meq/l - 220 meq/l. The urinary sodium excretion was directly related to the amount of salt consumed. Potassium value was less than in 90 meq/l in 37 people and in 33 people it was in the more than 90 meq/l.

84.5% of the people knew that increased salt consumption causes hypertension. 78.1% people knew that reducing salt will help them reduce hypertension but only 19% people thought it is very important for them to reduce salt. Only 13.6% of the people thought they consumed too much salt. About 75.4% of people

consumed food preserved with salt like pickles and among them 55.5% of people consumed pickles once or twice in a week .

### ➤ Conclusion

The daily salt consumption is about 9.6g per day and it is more than the recommended value by the world health organisation. It is seen that the knowledge of the people is good but their attitude and practice towards salt consumption is below the average line. It is evident that advice on reducing the salt consumption plays an important role in reducing blood pressure.

## I. INTRODUCTION:

Today excess salt intake has become a big monster in hypertension patients.

According to the latest guidelines of WHO elevated BP is 120-129/<80 mmHg; hypertension stage 1 is 130-139/80-89 mmHg, hypertension stage 2 is  $\geq 140/\geq 90$  mmHg. The ubiquity of hypertension is so high (29.6%) in india<sup>(2)</sup>. Hypertension is the direct cause for 57% of deaths due to stroke and 24% of deaths due to coronary artery disease in India<sup>(1)</sup> Over consumption of dietary sodium put at a risk of high blood pressure<sup>(5,6)</sup>. The association of salt intake and blood pressure is direct and continuous<sup>(4)</sup>. Knowing the adverse effects of excessive salt consumption on blood pressure and cardiovascular diseases, the World Health Organization has asked to take action to reduce death due to it<sup>(3)</sup>.

High sodium and low potassium inhibit the sodium pump and which increases the intracellular sodium and calcium levels, this induces vascular smooth muscles contraction and increases the peripheral vascular resistance<sup>(7)</sup>. The World Health Organization (WHO) says it is highly essential to reduce the salt to prevent from the complications of blood pressure.

A small reduction of salt intake to 6 g/day for a month has shown a decrease in blood pressure of 7.11/3.88 mm Hg in hypertensive individuals<sup>(4)</sup>.

Data are good among patients who remain hypertensive despite multiple drug treatment for hypertension, reducing sodium intake by 4.6g/d decreased systolic/diastolic blood pressure by 22.7/9.1mmHg<sup>(8)</sup>.

Though assessment of salt intake through a questionnaire based study and a single urinalysis may be inaccurate but it is sure that it will elicit attention on the life threatening impacts that are created because of it.

**II. OBJECTIVE**

1. To determine the quantity of dietary salt consumption among hypertensive patients.
2. To assess the knowledge awareness and attitude towards consumption of salt among hypertensive patients.
3. To suggest diet and lifestyle changes to the affected population.

**III. METHODOLOGY**

➤ *Study Design:*

Descriptive cross sectional study.

➤ *Study Population:*

Diagnosed hypertensive patients in Mappedu.

➤ *Study Period:*

For 3 months duration.

➤ *Sample Size:*

Sample size (n) is calculated using the chi-square method.

$$n = (Z\alpha)^2 pq / (d)^2$$

where,  $Z\alpha$  is the estimated error of calculation, here taken for 20% of p is the percentage of Subjects with positive findings from previous studies

$q = (100-p)$

d is Precision

Here,  $Z\alpha = 1.96$

$p = 46.4\%$

$q = 52.6\%$

$d = 9.4\%$  hence here  $n = 112$  subjects in the existing population.

Hence the sample size of the study is 110 subjects.

➤ *Inclusion Criteria:*

- Patients diagnosed to have hypertension according to the latest WHO guidelines.
- Patients in the age group of 18years -80years of age agreeable to participate in the study were added.

➤ *Exclusion Criteria:*

- Patients with any known electrolyte disturbance was excluded.
- Patients who are reluctant to participate in the study was excepted.

➤ *Tool:*

Interview based questionnaire and urinalysis.

➤ *Interview Based Questionnaire:*

The questionnaire contains **demographics** details and questions related to personal medical history, **average**

**consumption of salt** by the family member, **knowledge awareness and attitude** towards salt consumption.

➤ *Sample Collection :*

A **plastic container** was given and the patients was explained about the **urine sample collection** and we said them to collect the sample which was used for determining the sodium and potassium levels. The **110 number** of patients was selected through **simple random sampling method** who fit into the inclusion criteria.

**Urinalysis:** To determine the sodium and potassium levels

**Method:** Vitros dry chemistry analyser.

The study was conducted only after getting approval from the institutional ethics committee. Informed consent will be obtained from the patients and the confidentiality was maintained. Data was collected and assessed using **MS excel** and processed in **Statistical Package for the Social Sciences (SPSS)** software.

**IV. RESULTS**

In the study 110 participants were chosen. The mean age group of all the samples was 59.5 year with a range of 27years to 75 years. The males were 60 (54.5%) in number and the females were 50 (45.4%) in number. All are diagnosed to be hypertensive and are currently in medication. Among these a majority of 67.3% people had a sedentary life style and 14.5% people also followed traditional medicine along with anti-hypertensive drugs.

Age (In years)	Percentage of hypertensive patients	Number of males	Number of females
26-35	6 (5.4%)	4 (66.6%)	2 (33.4%)
36-45	21 (19%)	12 (57.1%)	9 (42.9%)
46-55	33 (30%)	17 (51%)	16 (49%)
56-65	30 (27.2%)	15 (50%)	15 (50%)
66-75	20 (18.1%)	12 (60%)	8 (40%)

Table 1:- demographic details

➤ *Knowledge and attitude about salt consumption and hypertension.*

84.5% of the people knew that increased salt consumption causes hypertension and 64.5% people knew that it causes serious health problems like stroke ,heart diseases etc.

78.1% people knew that reducing salt will help them reduce hypertension but only 19% people thought it is very important for them to reduce salt. 80.9% people think it is difficult to reduce the amount of salt consumed and 66.3% feel only old people should reduce the amount of salt in the food. About 76.3% people feel they consume more salt during summer. About 97.2% people thought that food has

no taste without salt. 33.6% of people knew that they should consume less than 5g of salt everyday. 74.5% people think that the amount of salt they consumed is just the right amount and only 13.6% of the people thought they consumed too much salt. 83.6% of the people knew that the processed food , meat and pickles contain a lot of salt.

Do you know that increased salt consumption causes hypertension ?	Yes	84.5%
	No	8.1%
	Don't know	7.2%
Do you think reducing the salt intake will help you reduce your blood pressure?	Yes	78.1%
	No	21.8%
How important to you is lowering the salt/sodium in your diet?	Not at all important	68.1%
	Somewhat important	12.7%
	Very Important	19%
What is the amount of salt that can be consumed by a person in a day?	More than 5g	46.3%
	Less than 5g	53.6%
What do you think is the amount of salt that you consume?	Far too much	10%
	Too much	3.6%
	Just the right amount	74.54%
	Too little	6.3%
	Far too little	5.45%

Table 2:- shows the knowledge and attitude about salt consumption and hypertension.

➤ *Practice of the people with regards to salt consumption*

About 61.8% people tried to avoid or minimise the consumption of processed food and stopped eating outside. 15.4% of people never added salt at the table , 38.1% of people added salt 4-5 times in a week and 23.6% of people added salt at the table daily. Only 3.6% people avoided salt completely and 10.9% of people consumed food cooked with salt only 3-4 times in a week and about 85.4% of people consumed food cooked with salt daily.About 75.4% of people consumed food preserved with salt like pickles and among them 55.5% of people consumed pickles 4-5 times in a week . 84.5% were non-vegetarians ( mixed diet) and 15.4% were vegetarian. Among the non-vegetarian 55.5% consumed non-vegetarian food at least twice in a week. The average amount of salt consumed by the people was 9.6g per day.

Do you add salt to food after cooking?	Never	15.4%
	Rarely (1-2times)	7.2%
	Sometimes (2-3times)	38.1%
	Often(4-5times)	6.3%
Do you add salt while cooking?	Always	23.6%
	Never	3.6%
	Sometimes (3-4times)	10.9%
Do you consume food that is preserved with salt like pickle.?	Always	85.4%
	Yes	75.4%
	No	24.5%
If yes how often do you consume...	Daily	18%
	Sometimes (4-5times)	31.3%
	Rarely (1-2times)	50.6%
How often do you consume non vegetarian food in a week?	Never	15.4%
	Rarely( 1-2times )	47.2%
	Sometimes (2-3times)	37.2%

Table 3:- shows the practice of the people with regards to salt consumption

Among the 110 participants , 70 participants gave the urine sample and 40 denied. In the 70 participants, 42 of them had urine sodium value more than 220 meq/l and 28 had the urine sodium value in the range of 40 meq/l - 220 meq/l.The urinary sodium excretion was directly related to the amount of salt consumed. Urine potassium value was less than in 90 meq/l in 37 people and in 33 people it was in the more than 90 meq/l. The average amount of sodium that was excreted is 168.83meq/l the average amount of potassium that was excreted was 80.5 meq/l.

**V. DISCUSSION**

The study involved 110 participants who were mostly in the age group off 45 to 65 and there was very little variation between the number of hypertensive males and females.The study found The participants to be fairly knowledgeable about salt with 84.5% of the participants knew about the harmful effects of increased consumption. The knowledge of the people compared to the other studies was almost double Garg et al study findings(48%).<sup>(9)</sup>, A little less when compared to Johnson et al study 90%<sup>(10)</sup> and almost equal with that of Aparna P et al 80%<sup>(11)</sup>. About 64.5% of the people knew that there are serious complications involving the kidney and heart because of consumption of high salt in our study but in aparna et al studies people were not aware of the other harmful effects<sup>(11)</sup>. In our study 20% of the participants were aware of the existence of recommendation of daily salt intake and out of them 33.6% knew that it should be less than 5 g per day but in this study Aparna P et al 5% of the participants where aware of the existence of recommendation of daily salt intake and 9% knew the exact amount<sup>(11)</sup>. Knowledge about the daily recommendation of participants in our study is less when compared to Johnson et al study where the knowledge was 70%<sup>(10)</sup>.

All these show that there is a Poor awareness among the general population about the recommendations. Study conducted by Fathima et al among the health care providers in Mangalore reported that less than half the participants were aware of the upper limit of dietary salt intake which shows that the people who are supposed to advise the patient are themselves unaware.<sup>(11)</sup>

In our study nearly 74.54% of the people reported to consume just the right amount of salt almost similar findings were seen in Johnson et al 73% and Garg et al 67% and Aparna et al 80 %.<sup>(9,10,11)</sup> In our study 68.1% of the people think it is not important for them to reduce the salt intake but in Aparna et al three fourth of the participants believe that reducing salt diet is important<sup>(11)</sup> which shows that the knowledge and the behaviour of the people in our study is not related, though they were aware of the serious complications that occurs due to high salt intake they are not ready to change their behaviour to reduce the amount of salt they should consume. Almost 85.4% of the people added salt to the food that was the cooked home which remains to be the major portion of salt that was consumed. In the study by Aparna et al more than half the participants added salt while cooking<sup>(11)</sup>. About 75% of the people consume pickles of which 50.6% consumed it only once or twice in a week. The quantity was also really less which shows that pickles were not major contributions for increased salt consumption this was also similar to that of Aparna at all study<sup>(11)</sup>. In a study by Ravi S et al 61.8% of the people try to avoid or minimise the consumption of processed food and stopped eating outside<sup>(13)</sup> the same way in the Johnson et al study the main method of restricting salt was by using spices other than salt followed by avoiding eating outside and avoiding processed food<sup>(10)</sup>. In another study about 75.3% consume processed and ready to eat foods and patient had a tendency to add extra salt while cooking.<sup>(14)</sup> In the studies like Marakis et al and Land et al the way they used to reduce the salt was by avoiding processed food<sup>(15,16)</sup>. A study by Nair et al shows that processed ready to eat foods was the major source of salt for men and among women was from cooking and table salt.<sup>(17)</sup> The discretionary salt is the major contributor of excess salt in our study. In addition to this 23.6% of the people added salt at the table daily and 38.1% of the people add salt at the table 4- 5 times in a week. Measures to reduce salt intake should focus on changing the discretionary salt in addition to avoiding salt on the table and avoiding food packed outside or packed food. In our study only a very less population consumed packaged food. Avoiding packaged food is important as most of the processed packaged food in our country do not have High potassium to sodium ratio which is desirable for good health.<sup>(18)</sup> Hence it's easier to control salt intake in our population unlike in Australia and other countries where the major contributory is processed food which makes it challenging for them to control<sup>(19)</sup>. About 47.2% of the people consume not vegetarian mostly the form of meat. Meat products contribute a high amount of dietary sodium.<sup>(20)</sup> The average amount of salt intake in our study was 9.6 g per day which is higher than the recommended value of less than 5 g per day by the world health

organisation findings of our study even compare to other studies across the nation documented that salt intake ranges from 7 to 42 g per day<sup>(21-23)</sup>. Average amount of salt that was consumed in another SCRIPT study was higher than our value 10.9 g per day which shows that though the consumption of our people is high it is comparatively less than others.<sup>(14)</sup> Intersalt study which was conducted to estimate the amount of salt ingested in Italy Finland Portugal where between 9 to 12 g per day while another Netherlands and Denmark the ingestion was between 8 to 9 g per day.<sup>(24)</sup> We estimated salt intake among the study group by measuring sodium excretion and potassium excretion in a spot urine samples. The results revealed that the average amount of sodium excreted is 168.83meq/l and potassium excreted is 68meq/l. The results show that there is Almost double the amount salt consumed from the current WHO recommendation. The results of the study conducted among the Egyptians was found to have low sodium intake with the mean sodium excretion of 110 meq/day.<sup>(25)</sup> The results of the current study are consistent with the results of other studies conducted in Tehran where the average sodium value was 130meq/day<sup>(26)</sup> and in Saudi Arabia it was 150.3meq/day.<sup>(27)</sup>

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