

LETTER TO THE EDITOR

COMPARISON OF SPOT TESTING KIT WITH IODOMETRIC TITRATION METHOD IN THE ESTIMATION OF IODINE CONTENT OF SALT

Sir,

( Received on March 1, 1996 )

The standard method for the estimation of iodine content of iodised salt is "Iodometric Titration" (IT) (1). However, recently a simpler method known as the "Spot Test for Iodine Estimation" has been developed. In this method, estimation of iodine content of salt is done with the help of a standard starch solution provided in the Spot Testing Kit (STK). This method has been advocated as a method for the semi-quantitative estimation of iodine in salt. The present study was therefore conducted to compare the utility of the STK against the standard iodometric titration in the semi-quantitative estimation of iodine in salt.

A total of 3629 salt samples were collected from the states of Haryana, Himachal Pradesh and Madhya Pradesh. Each salt sample was coded, and analysed for its iodine content by : iodometric titration and the STK methods. The iodometric titration was done by a team of two research assistants (team A). The coded salt samples were then given to another team (team B) for the estimation of iodine content by the STK method. Team B was not aware about the results of the iodometric titration.

The procedure for use of spot testing kit was as follows : The STK consists of the test solution (A) and a recheck solution (B). One drop of test solution (A) was added to a spoonful of salt sample. The change in colour of salt sample ranged from white to light blue to dark violet depending on the iodine content of salt, i.e. Nil, 7 ppm, 15 ppm, 30 ppm, which was compared to the standard colour chart provided with the kit. If on addition of test solution (A), no change in colour of salt was observed, the recheck solution (B) was added. This was done to make the salt medium acidic, (in case the salt had alkaline constituents) and then the test solution (A) was added again. The intensity

of the blue colour was directly proportionate to the iodine content of salt. The results of iodine content of salt were reported under two categories i) salt samples with less than 15 ppm of iodine and ii) salt samples with 15 ppm and more of iodine.

For the interpretation of results, Sensitivity, Specificity, Positive Predictive Value (PPV) and Negative Predictive Value (NPV) of the STK in relation to the iodometric titration were calculated, using the standard formulae (2).

Results of the present study are depicted in Table I. Sensitivity of the STK against the IT method was observed to be 85.47% whereas specificity was 71.25%. The PPV and NPV were found to be 87.50% and 67.57%, respectively (Table I).

TABLE I: Results obtained by Iodometric titration and the Spot Testing Kit (STK).

STK	Titration method		
	15 ppm and more	< 15 ppm	Total
15 ppm and more	2177	311	2488
< 15 ppm	370	771	1141
Total	2547	1082	3629

$$\text{Sensitivity} = \frac{2177}{2547} \times 100 = 85.47\%$$

$$\text{Specificity} = \frac{771}{1082} \times 100 = 71.25\%$$

$$\text{Positive Predictive Value} = \frac{2177}{2488} \times 100 = 87.50\%$$

$$\text{Negative Predictive Value} = \frac{771}{1141} \times 100 = 67.57\%$$

Iodometric titration is the recommended method for the estimation of iodine content of salt (1). However, it requires a laboratory set up and trained manpower. An earlier study conducted on the utility of STK in estimation of iodine content of salt reported the sensitivity of STK to be 96% and specificity of 16% (3). The higher specificity in the present study could be due to the fact that about 75% of the total

salt samples were of powdered salt. The powdered salt was white and hence provided better colour indication to assess the iodine content of salt as compared to crystalline salt. The results revealed that STK can be used for the semi-quantitative estimation of iodine content of salt for the purpose of monitoring the quality of salt available to the community, as it is a simple tool compared to the iodometric titration.

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#### REFERENCES

1. Tyabji R, Karmarkar MG, Pandav CS, Carriere CR, Acharya S. Estimation of iodine content in iodated salt. In : A hand book of monitoring and quality control. New Delhi, UNICEF, ROSCA Publication 1990; pp 18-32.
2. Hennekens CH, Buring JE. Epidemiology. In :  
Medicine. Little Brown and Co. Publishers. 1987; pp 331-332.
3. Kapil U, Nayar D, Goindi G. Utility of Spot Testing Kit in the quantitative estimation of iodine content in salt. *Indian Pediatr* 1994; 31 : 1433-1435.