

## GOITROGENS AND GOITRE--- A CLINICOSOCIAL STUDY OF ASSOCIATION

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### Abstract:

Research Problem : Is there any role of goitrogens in the causation of goitre?

Objectives : (1) To describe the intake of goitrogenic substances in goitrous and non-goitrous patients.

(2) To find out the types and frequency of goitrogenic substances in these patients.

Study Design : Hospital-based Study by Questionnaire Method.

Setting : Endocrinology Out Patients Department, J.N.Medical college Hospital, A.M.U., Aligarh.

Participants : Cases were patients having clinical features of iodine deficiency disorders (IDD) and controls were not having goiter but they had other endocrinological disorders in the Endocrinology O.P.D. at J.N. Medical College Hospital, A.M.U., Aligarh.

Study variables : Intake, type and frequency of goitrogenic substances.

Outcome variables : Percentage of goitrous and nongoitrous patients consuming goitrogenic substances.

Statistical Analysis : Chi-Square Test.

Result : In goitrous patients, a dietary history of goitrogen intake was found in 93.85% patients while in nongoitrous patients, it was 76.92%. Commonly consumed vegetables having goitrogenic properties were Cabbage, Cauliflower and Lady's finger. Intake was frequent (once a week) in most of the goitrous patients while it was taken occasional (once fortnightly) in most of the nongoitrous patients.

Conclusion : Majority of the goitrous patients were consuming goitrogenic substances. Their role in the causation of goiter is clearly understood. However, for this further research activities should be carried out to find out the strength of association.

**KEY WORDS : IDD, Goitre, Goitrogens**

### Introduction :

Goitrogens are chemical substances leading to the development of goiter. They interfere with the iodine utilization by the thyroid gland.

The brassic group of vegetables e.g. Cabbage and Cauliflower may contain goitrogens<sup>1</sup>. Goitrogenic potency of some of the common vegetables namely Cabbage, Turnip, Lady's finger, Sweet Potato, Cassava has been studied in experimental rats<sup>2</sup>.

Excessive intake of goitrogens e.g. through eating Cassava interferes with the normal intake and metabolism of iodine and may amplify the effect of iodine deficiency.<sup>3</sup>

Experimental goiters were produced by Chesney in rabbits by feeding them with Cabbage and by Purves in rats by feeding them with brassica seeds.<sup>4</sup> Reports from other countries indicated that endemecity of goiter could result from the presence of goitrogenic principles in foods.

### Materials & Methods :

This study was conducted among the patients attending Endocrinology Clinic, Jawahar Lal Nehru Medical College, Aligarh Muslim University, Aligarh (U.P.) for a period of one year for a comprehensive knowledge and better understanding regarding iodine deficiency disorders.

All patients attending the Endocrinology Clinic constituted the study population. Total Number of Patients in one year duration was 936, out of which 407 were having thyroid disorders.

It was not possible to inquire in detail, examine and to collect the samples in all the patients, therefore it was decided that for purposive selection, every third patient was taken into consideration. 315 patients were interrogated. Out of these, patients of thyroid disorders were 135. These 135 patients were further inquired to give 103 cases of iodine deficiency. Out of these 103 cases, 65

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patients were having goiter. 65 controls were taken from the same endocrinology clinic but they had endocrinological disorders other than goiter. Like to like matching was done between cases and controls. Data were collected and recorded on a proforma and later tabulated and analysed.

### Observations & discussion :

A dietary history of goitrogenic substances was found in 61 patients (93.85%) having goiter (cases). In nongoitrous patients (controls) a dietary history of goitrogenic substances was found in 50 patients (76.92%). The difference of dietary history regarding goitrogenic substances between cases and controls was found statistically significant ( $\chi^2 = 7.45$  d.f. = 1  $p < 0.01$ ).

The type of vegetables containing goitrogenic substances, consumed was mostly cabbage, cauliflower and lady's fingers in both the groups. In cases, cabbage was consumed by 86.89% patients followed by cauliflower and lady's fingers (85.25%). Turnip was taken by 52.46% cases and 50.0% controls. There was no clear difference in consumption of different types of foods between cases and controls.

Majority of the goitrous patients (45.90%) were taking these substances frequently (once weekly) followed by occasionally (once fortnightly (50.89%) while only 13.11% patients were consuming these substances regularly (2-3 times a week).

Most of the nongoitrous patients (controls) were consuming these foods occasionally (74.0%). Only a small number of patients were taking these substance regularly (6.0%) and frequently (20.0%). There was a definite variation in frequency of intake of these substances between cases and controls. This difference was found statistically highly significant ( $\chi^2 = 12.14$ , d.f. = 1  $p < 0.001$ ).

### Conclusion :

On the basis of all these results, it was found that majority of goitrous patients were giving history of goitrogenic substances intake in their diet. Most common foods containing goitrogenic substances, consumed, were cabbage, cauliflower and lady's fingers followed by turnip and maize. As far as frequency of intake was concerned, majority of the goitrous patients took these substances frequently (once weekly) while most of the non goitrous patients took these substance occasionally (once fortnightly). On the basis of the results we can assume that there is definite role of goitrogenic substances in the causation of goiter. However other dietary actors like consumption of type of salt may be taken into account for better and precise results. Mechanisms of goitrogen's action in relation to iodine utilization and thyroid hormone synthesis have to be studied further. The practical significance of experimental studies in animals needs to be evaluated in human situations.

**Table-I Distribution of patients according to intake of goitrogenic substances**

S.No.	Goitrogen	Goitrous Patients (Cases)		Non-goitrous (Controls)	
		No.	%	No.	%
1.	Present	61	93.85	50	76.93
2.	Absent	04	06.15	15	23.07
	Total	65	100.00	65	100.00

( $\chi^2 = 7.5$ , d.f. = 1,  $p < 0.01$ )

**Table-II Distribution of patients according to types of goitrogen intake**

S.No.	Type of Goitrogens	Cases	%	Controls	%
1.	Cabbage	53	86.89	40	80.00
2.	Cauliflower	52	58.25	41	82.00
3.	Turnip	32	52.46	25	50.00
4.	Maize	17	27.87	10	20.00
5.	Lady's finger	52	85.25	38	76.00
6.	Others	03	04.92	01	02.00
		n = 61		n = 50	

**Table-III Distribution of patients according to frequency of goitrogen intake**

S.No.	Frequency	Cases	Percent	Controls	Percent
1.	Regularly	08	13.11	03	06.00
2.	Frequently	28	45.90	10	20.00
3.	Occasionally	25	40.98	37	74.00
Total		61	100.00	50	100.00

( $X^2 = 12.14$ , d.f. = 1,  $p < 0.001$ )

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