The Professional Medical Journal
www.theprofesional.com

DOI: 10.29309/TPMJ/2019.26.02.3118

ORIGINAL PROF-0-3118

ANANAS COMOSUS;

A POSSIBLE TREATMENT OF ENDEMIC GOITER IN YOUNG UNMARRIED FEMALES.

Abdul Rehman Khokhar[1], Tanvir Ali Khan Shirwany[2], Muhammad Shahid Faruqi[3], Qurrat-ul Aen Rehman[4], Abdul Majeed Cheema[5]

1. MBBS, DCH, MCH&N, M.Phil (Physiology),PhD Scholar. Associate Professor Department of Physiology Ghazi Medical College, D.G. Khan.
2. MBBS, MS (USA) Principal / Professor Department of Physiology CMH Medical College, Bahawalpur.
3. MBBS, M.Phil Professor Department of Physiology ABWA Medical College Faisalabad.
4. MSc, BED, Associate Professor Department of Biology PAEC Science College D.G. Khan.
5. Ph.D, Physiology Professor Department of Physiology IMBB University of Lahore.

Correspondence Address:
Dr. Abdul Rehman Khokhar
Department of Physiology
Ghazi Medical College, Dera Ghazi Khan.
arehmankhokhar777@gmail.com

Article received on:
26/06/2018
Accepted for publication:
25/11/2018
Received after proof reading:
31/01/2019

ABSTRACT… Background: The Significant role of iodine as a remedy for endemic goiter is well known. But Major problem is iodine loss due to sublimation. Ananas Comosus may be a good source of iodine. **Study Design:** Randomized controlled study. **Setting:** Department of Physiology, PGMI, Lahore in collaboration with DHQ teaching hospital D.G. Khan. **Period:** May to August 2017. **Materials and Methods:** Study objective was to measure efficacy of Fresh Ananas Comosus among young unmarried female with endemic goiter. Simple random sampling technique was applied. Seventy newly diagnosed cases of endemic goiter were selected by simple random sampling. 35 subjects were included in study group and 35 subjects were taken as control group. Dose of Ananas Comosus was standardized by P.C.S.I.R laboratories complex Lahore. Data Analysis was carried out by using SPSS version 16.0. For comparison of different groups, t-test was used **Results:** The baseline goiter size (mean + SD) of study group (n=29) and control group (n=30) was non-significantly different. After 8 weeks of intervention goiter size was highly significantly ($P<0.001$) reduced in study group. Mean serum TSH suppression was also significant. Serum T4 and T3 levels also showed improvement after 8 weeks of Ananas Comosus ingestion. **Conclusion:** Fresh Ananas Comosus can be used as therapeutic agent for endemic goiter patients.

Key words: Ananas Comosus, Endemic Goiter, Treatment, Iodine.

Article Citation: Khokhar AR, Shirwany TAK, Faruqi MS, Rehman QA, Cheema AM. Ananas comosus; a possible treatment of endemic goiter in young unmarried females. Professional Med J 2019; 26(2):334-338.
DOI: 10.29309/TPMJ/2019.26.02.3118

INTRODUCTION

Endemic goiter is defined as an enlargement of thyroid gland in people living in region of iodine deficient soil, usually these region are away from the seacoast.[1] Goiter is prevalent primarily in areas where drinking water or soil contain little iodine. The affected areas are, where tropical rainstorms and floods have leached iodine from soil. Goiter is almost nonexistent in areas, where iodine rich vapors from the sea condense and deposit iodine on the soil, so that inhabitants of most coastal areas are relatively free of goiter.[2]

Endemic goiter is a common world wide problem especially among women of childbearing age and children. More than12% of world population in affected by endemic goiter.[3] In Pakistan an alarming high prevalence of iodine deficiency goiter has been reported from northern areas of country in lap of Himalayas.[4] The prevalence of goiter among Pakistani women was found to be 21% at national level, 24% rural areas and 17% in urban areas.[5] Peoples living in mountains and sub mountains region of Pakistan have poor iodine nutrition.[6]

About 90% of iodine comes from diet and remaining from drinking water.[7] Food sources of iodine are yogurt, cheese, sea-salt, sea-fish, fresh pineapple, strawberries and food additives.[8] National utilization level of iodized salt is only 17% as projected in Economic Survey of Pakistan.[9]

Pineapple is a good source of iodine, vitamin c, and potassium. It has wide spectrum of actions and has been used for medicinal properties for hundred of years.

Two slices of pineapple are usually recommended as adult dose per day.[10] Each 100 gm of fresh

pineapple contains 4.1mg of iodine.[11] Bromelain is a complex mixture of proteolytic enzymes. This is the basis for the medicinal use of pineapple.[12] The study was undertaken to measure efficacy of Ananas Comosus (fresh pineapple) as therapeutic agent among unmarried females with endemic goiter.

MATERIAL AND METHODS

Seventy newly diagnosed cases of endemic goiter were selected by simple random sampling. 35 subjects were included in study group and 35 subjects were taken as control group. This randomized controlled study was carried out in the department of physiology, PGMI, Lahore in collaboration with DHQ teaching hospital D.G. Khan. Dose of Ananas comosus was standardized by P.C.S.I.R laboratories complex Lahore.[13] This study includes young unmarried females of age 15-25 years who came to the hospital for the treatment of endemic goiter.

The study design was randomized clinical trial and simple random sampling technique was used for allocation into two groups.

Prior to initiation of the study, planned visit to homes of subjects were undertaken to explain the salient points of study and to obtain the written consent of the subjects. Subjects were advised not to consume foods/fruits and drugs having high iodine content.[14] Subject suffering from thyrotoxicosis, bleeding disorder, diabetes myelitis, history of intake of goitrogenic foods and drugs which leads to goiter, solitary nodular goiter with history of pain and lymphadenopathy, history of intake of iodized salt were also excluded.[15-19] Blood samples were taken at 0, 8 and 10 week from both groups for estimation of serum T_3, T_4, and TSH and subsequently goiter size was measured and finding were recorded in the proforma. Microlab -300 Analyzer was used for serum T_3, T_4 and TSH estimation by ELISA kits Human Germany. Estimation of serum T_3, T_4, and TSH was done at Post Graduate Medical Institute Laboratories Lahore. Data analysis was carried out by using SPSS 16.0 version. For comparison of changes in parameters of between study and control groups, t-test was employed. The study objective was to assess effect of Ananas Comosus among endemic goiter patients.

RESULTS

Seventy unmarried female patients with newly diagnosed endemic goiter were randomized, and equally divided into study group and control group. Out of these eleven patients were lost during follow up. The study group finally consisted of 29 females and control groups consisted of 30 female patients. At baseline mean ± SD of age, T_3, T_4, TSH and goiter size were non- significantly different between the study and control group. Family history of goiter was positive in 71.28% of subjects. Only 14% of the subjects had knowledge about the iodized salt and they were not using it due to high cost and non availability at nearest shop. Goiter size was highly significantly reduced in study group and TSH suppression and normalization of serum T_3 and T_4 were noted after eight weeks of pineapple ingestion.

At end of treatment goiter size was highly significantly ($P<0.001$) reduced in the study group at eight weeks (0.93 ± 0.81). Two weeks post treatment goiter size remained reduced (2.44 ± 0.46) as compared with the control group (Table-I). This reduction was seen during the consumption of Ananas Comosus by the study group. It indicated that effect of pineapple ingestion was not persistent on goiter size reduction.

TSH levels were highly significantly reduced in study group at week eight (2.01 ± 1.03) as compared with control group ($P<0.00$). Two weeks after cessation of intervention TSH level was 2.16 ± 1.18 ($p <0.00$) among study group. It reflected that TSH levels suppression was persistent even after the cessation of pineapple ingestion at eight week.

Serum T_3 level at eight weeks were significantly different from its baseline value after pineapple ingestion but after cessation of ingestion of pineapple difference was not significant. Serum T_4 was significantly improved at eight weeks pineapple ingestion. While at ten week serum T_4 was not significantly different from its baseline in

the study group. Serum T_3 and T_4 values in the control group were non-significantly different at eight and ten weeks from its baseline value (Table-II)

Time	Goiter Size		
	Control Group (n=30)	Study Group (n=29)	P-Value
Baseline	2.33 ± 1.24	2.63 ± 0.85	0.06
8 Weeks	2.71 ± 1.21	0.93 ± 0.81	0.00
10 Weeks	2.69 ± 1.66	2.44 ± 0.46	0.33

Table-I. Comparison of goiter size and TSH levels between control and study group.

	TSH level			T_3			T_4		
Time	Control Group (n=30)	Study Group (n=29)	P-Value	Control Group (n=30)	Study Group (n=29)	P-Value	Control Group (n=30)	Study Group (n=29)	P- Value
Baseline	4.21±1.03	4.40±0.85	0.75	6.84±2.17	7.78±1.96	0.08	1.45±0.46	1.29±0.46	0.20
8 Weeks	4.22±1.03	2.01±1.03	0.00	6.92±1.93	5.84±2.07	0.03	1.17±0.44	1.10±0.31	0.48
10 Weeks	4.21±1.15	2.16 ±1.18	0.00	6.65±2.22	7.18±1.17	0.25	1.43±0.50	1.11±0.52	0.19

Table-II. Comparison of T_3 and T_4 levels between control and study group.

DISCUSSION

Many patients with hypothyroidism seek medical advice due to goiter which causes cosmetic disfigurement of neck.[20] Fresh pineapple ingestion found to produce improvement in hormonal thyroid status and reduced goiter size from its baseline after eight weeks.[21] Many research studies have been carried out using chemical substances to study their effects on thyroid goiters. But evidently no such study appears to evaluate effects of fruits like pineapple and strawberries on goiters size. In this respect our study is a pioneer one.

Brenta G et al (2003) evaluated the therapeutic efficacy of levo-thyroxin (L-T4) and tri-iodo-thyroacatie acid (TRIAC) among 36 Caucasian women suffering from non toxic diffuse goiter. After randomization, therapeutic dose 50mg of L-T4 and 350 mg twice daily of TRIAC was given for eleven months. Goiter size reduced to 42% in TRIAC group and this study showed -50% reduction which was remarkable. In our study goiter size reduction was more with lesser duration of treatment as compared with findings of Brenta G et al (2003).[22] In addition to goiter size reduction there was improvement in T_3, T_4 levels and highly significant TSH suppression ($P<0.001$).

Huysmans et al (2004) for treating large compressive goiters with I^{131}, single dose, 100 micro-curies/gm of thyroid tissue. After one year, MRI of thyroid showed, -40 + 15% goiter size reduction and improvement in clinical signs, symptoms.[23] Our findings showed a goiter size reduction in only eight weeks of pineapple ingestion.

Zimmerman et al, (2004) studied, Moroccan children (n=159) of 6-16 years with severe iodine deficiency were given the iodized salt 25ug iodine / gm salt, added to local salt as potassium iodide salt. After five months and one year evaluation of subjects goiter size was reduced to – 34%, and serum T3, T4 and TSH levels were improved.[24] He found a rapid relapse of thyroid dysfunction and goiter often discontinuation of treatment. Our studied showed greater goiter size reduction in only eight week of pineapple ingestion.

FDA (Federal Drug Authority) documented that L-Thyroxin results TSH suppression after 4-6 months duration while this study showed TSH suppression after 08 weeks of pineapple ingestion.[25] Our finding showed a statistically significant ($P<0.001$) reduction in goiter size at eight weeks. The safety of this mode of treatment of endemic goiter during pregnancy and lactation is not established.[26-28]

CONCLUSION

Pineapple ingestion may be a cost effective treatment for academic goiter. As this is a food

item, it can also improve the patient compliance. It is effective in a very short duration.

REFERENCES

1. Vanderpas J, **(2006) Nutritional epidemiology and thyroid metabolism.** Ann Rev Nutr.26, 293-322.
2. Scott A, **(1995) Micronutrient minerals In: Guthrie HA, Picciano MF (ed).** Human nutrition, 363-5.
3. Adwok J, **Endemic goiter [on line] 2009** [cited 2009 May 15]; 1-9 accessed at www.utoronto.ca/OIS/SIA / endemic goiter.
4. Akhtar T, Zahoorullaha, Paracha PI, Lutfullah, **(2004) Assessment of salt iodization on prevalence of goiter in district Swat.** Pak J Med Sci.20, 303-7.
5. **National Nutritional Survey of Pakistan, (2002) Federal Bureau of statistics, Government of Pakistan.** 35-37.
6. National Nutritional Survey of Pakistan, **(2012). Agha Khan University, Pakistan, Pakistan Medical Research Council (PMRC) Nutrition Wing, Ministry of Health, Government of Pakistan.** 1-50.
7. Mclaren DS, **(2013) Nutrition and its disorders In: Park JE (ed).** Preventive and social medicine. 22th Ed. 450-1.
8. Kluwer W, **(2005) Pineapple, Review of natural products, facts and comparison.** In: Kluwer W (ed). Wolter Kluwer Health 145-67.
9. **Economic Survey of Pakistan (2006), Government of Pakistan.** Health and Nutrition. 185-7.
10. **Pineapple Health benefits [online]** 2009 [cited 2017 Aug 10] 1-5 accessed at WWW.bizaimscom/coffee+break/advices+projects/pineapple+health+benefits.
11. Guangzhou, **(2009) Nutritional contents of Ananas comosus. Encyclopedia for websites of food and nutrition in china, food mate group net.** Foodmate. net/tool/yingang/06/5/002/html.
12. Maurer HR, **(2001)** Bromelain, **Biochemistry Pharmacology and medical use.** Cell Mol Life Sci. 58, 1234-45.
13. Pakistan Council of Scientific & Industrial Research Laboratories complex, Lahore. **Test Report, Pearson's composition and analysis of food, 1992.** PGMI, Lahore No. FBRC/AJ/ANAL/ REA 206 Dated 19-04-2010.
14. Arm SM, Hex, Braveman LE. **(2009) Excess iodine from an Un-expected source.** N Eng J Med 360, 424-6.
15. Al-Shaikh AA **(2009) Outcome of hyperthyroidism treated by Radio-active iodine.** Pak J Med Sci 25,293-97.
16. Glaser D, Hilberg T, **(2006) the influence of bromelain on platelet Count and platelet activity in vitro.** Platelets. 17, 37-41.
17. Brown DC. **(2006) Drugs causing hypothyroidism. Anti-thyroid drugs.** In: Bennett PN, Brown MJ. (ed). Clinical Pharmacology 9th Ed.699-707.
18. Imran AA, Majid S, Khan SA. **(2005) Diagnosis of enlarged thyroid-an Analysis of 250 cases.** Ann King Edward Med Coll.11, 203-4.
19. Khan MA, **(2001) Consequences of iodine deficiency disorders.** The News International Nov 14, 17-18.
20. Elahi S, Syed Z, Nazear T, Hassan MA. Nagara SA, Hyder SW. **(2005) A study of goiter among adolescent females referred to center for Nuclear Medicine Lahore,** Pak J Med Sci. 21, 56-61.
21. Zimmerman M, Adou P Torresani T, Zeder C. Hurrell R. **(2000) Low dose oral Iodized oil for control of iodine Deficiency in children.** Br J Nutr 84, 139-41.
22. Brenta G, Schnitman M, Fretes O, Facco F, Gurfinkel M, **(2003)Damilanos etal. Comparative efficacy and side effects of the treatment of euthroid goiter with levothroxine or Tri iodothyroacetic acid.** J Clin. Endoerinol Metab, 88, 5287-92.
23. Huysmans DAKC, Hermus ARMM. Corstens FHM Barentrz JO. **Kloppenborg PWC (2004) Large Compressive goiters treated with radioiodine.** Am J Clin Nutr. 79,642-5. WWW.annals.orgiegi/contents/full/121/10/757on6/18/2009.
24. Zimmermann MB, Wegmuller R, Zeder C. Torresani T, Chaouki N. **(2004) Rapid relapse of thyroid dysfunction and goiter in school children after discontinuation of salt iodization- Am J Clin Nutr.**79:642-5.
25. FDA (2016), **Drug information Levo-thyroxine – Clinical Pharmacology accessed online** on 06 Feb, 2016 at www.drugs.com/pro/levethyroxine.html.
26. Sharma H (2014), **Pineapple during pregnancy: Is it safe? Health Editorial accessed on 10 Jan 2018,** at www.myhealth.com/pineapple-during pregnancy.
27. Sarfarz S, Rubab B, Fatima W, Ramzan S, Iqbal M (2015). **Fruits and Vegetables contraindicated in pregnancy: Myth or Reality.** WJPPS. 4:1785-93.
28. FDA (2018) Medeiros L, Kendal PA, Hillers V, **Food safety for pregnant women.** USDA & FDA, 1-19.

Good **teachers** know how to bring out the best in **students.**

"Charles Kuralt"

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Abdul Rehman Khokhar	Principal author, conducted research.	
2	Tanvir Ali Khan Shirwany	Co-author	
3	M. Shahid Farqui	Data analysis	
4	Qurrat-ul Aen Rehman	Assisted research paper writing.	
5	Abdul Majeed Cheema	Paper writing, Results, Data interpretation	