

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/26863785>

# Residual Goiter in Semrom; Iodine Status and Thiocyanate Overload Do Not Play a Role

Article in *Journal of Tropical Pediatrics* · October 2009

DOI: 10.1093/tropej/fmp096 · Source: PubMed

CITATIONS

0

READS

63

8 authors, including:



[Massoud Amini](#)

Isfahan University of Medical Sciences

209 PUBLICATIONS 2,129 CITATIONS

[SEE PROFILE](#)



[Mansour Siavash Dastjerdi](#)

Isfahan University of Medical Sciences

49 PUBLICATIONS 374 CITATIONS

[SEE PROFILE](#)



[Ashraf Aminorroaya](#)

Isfahan University of Medical Sciences

91 PUBLICATIONS 924 CITATIONS

[SEE PROFILE](#)



[Roya Kelishadi](#)

Isfahan University of Medical Sciences

588 PUBLICATIONS 8,659 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



Isfahan Vitamin D project [View project](#)



Isfahan Cohort Study [View project](#)

All content following this page was uploaded by [Ashraf Aminorroaya](#) on 22 May 2014.

The user has requested enhancement of the downloaded file.

## Discussion

It is rare to find research which deals with the incidence of infection by this parasite. Unlike prevalence which describes the status of a disease, incidence studies the intensity of how a disease attacks a studied community. In this study, we found that for every 100 children who live in the studied region, 7.49 are infected after 1 year and that the serology remains positive for 4 years. All children infected with *T. canis* present with the asymptomatic form as per the Pawlowsky classification [2], but if we consider that in 3 years nearly a quarter of these children will be infected, this may increase the risk that one of these children will present with one of serious forms of infection by this parasite [3].

CARLOS R. S. CORREA, and CARLA M. BISMARCK  
 Departamento de Medicina Preventiva e Social, FCM,  
 Unicamp, Laboratório de Geoparasitas e Imunologia,  
 Universidade Estadual de Campinas, City of  
 Campinas, Sao Paulo State, Brazil

doi:10.1093/tropej/fmp095

Advance Access Published on 22 October 2009

## References

1. Won KY, Deanna K-M, Peter MS, *et al.* National seroprevalence and risk factors for zoonotic toxocara spp. infection. *Am J Trop Med Hyg* 2008;79:552–7.
2. Pawlowsky Z. Toxocariasis in humans: clinical expression and treatment dilemma. *J Helminthol* 2001;75:299–305.
3. Zarnowska H, Borecka A, Gawor J, *et al.* A serological and epidemiological evaluation of risk factors for toxocariasis in children in central Poland. *J Helminthol* 2008;82:123–7.

## Acknowledgements

The authors would like to thank Prof. Luiz Candido Souza Dias, and all the community health workers and professionals from the Unidade Basica de Saúde do Jardim Santa Mônica, Campinas, SP, Brazil, and all the workers in União Cristã Feminina, and EEPG 31 de Março, Campinas, SP, Brazil for their tireless efforts and dedication, without which this survey would not have been possible.

Correspondence: Carlos R. S. Correa, Departamento de Medicina Preventiva e Social, FCM, Unicamp, Laboratório de Geoparasitas e Imunologia, Universidade Estadual de Campinas, City of Campinas, Sao Paulo State, Brazil.  
 E-mail: <ccorrea@fcm.unicamp.br>.

## Residual Goiter in Semirom; Iodine Status and Thiocyanate Overload Do Not Play a Role

### Summary

**This study was performed to investigate the role of thiocyanate overload in the etiology of endemic goiter in schoolchildren of Semirom, Iran. A total of 1828 schoolchildren were selected by multi-stage random sampling. Urinary iodine concentration (UIC) and urinary thiocyanate (USCN) were measured in a group of these children. The median UIC was 18.5 µg/dl. The mean ± SD of USCN in goitrous and nongoitrous subjects did not differ significantly (0.75 ± 0.78 mg/dl vs. 0.63 ± 0.40 mg/dl;  $p=0.30$ ). Finally, we concluded that neither iodine deficiency nor thiocyanate overload contributed to the high prevalence of goiter in Semirom. The role of other goitrogenic factors should be investigated in this region.**

**Key words: goiter, iodine deficiency, goitrogens, thiocyanate, Iran**

The relationship between goiter and iodine deficiency is well established. However, a number of genetic and environmental factors also exist, which can contribute to the risk of goiter. Naturally occurring goitrogens are among the environmental contributors to goiter [1, 2]. Thiocyanate (SCN) is one of the best known and most widely studied goitrogens responsible for causation or aggravation of endemic goiter especially in a relatively or severely iodine-deficient region [3]. SCN affects thyroid function depending on its concentration. At low concentrations, stimulation of thyroid function was found [4], whereas a pathologically elevated concentration of SCN acts as a competitive inhibitor of  $I^-$  transport in the thyrocyte [5].

Semirom is a mountainous region in central area of Iran. Because of the increased goiter prevalence, all citizens of Semirom were given a single dose injection of 480 mg iodized oil intramuscularly in 1993. In 1994, universal mandatory salt iodization program was started in Iran. The present study aimed to determine the role of SCN overload in the etiology of endemic goiter in Semirom schoolchildren.

The methodological protocol of the study was described in detail elsewhere [6]. In summary, 1828 schoolchildren with mean age of  $9.33 \pm 1.03$  years were selected by multi-stage cluster random sampling in 2003. Goiter staging was performed by inspection and palpation. Urinary iodine concentration (UIC) was measured in 132 children by the digestion method based on a modification of Sandell–Kolthoff reaction [7]. Urinary SCN (USCN) was determined in 144 children by the method of

Aldridge as modified by Michajlovskij and Langer [8]. Mann–Whitney U-test was used to compare measurements in different groups. Prevalence of high USCN between goitrous and normal children was compared by chi-square test. Written consent was obtained from all children's parents who were informed about the study. The study was approved by the ethics committee of the Isfahan Endocrine and Metabolism Research Center affiliated to Isfahan University of Medical Sciences.

Overall, 36.7% of subjects were classified as goitrous. Goiter prevalence among girls and boys was 38.6 and 35.0%, respectively ( $p=0.06$ ).

The mean  $\pm$  SD and median UIC was  $19.3 \pm 9.1$  and  $18.5 \mu\text{g}/\text{dl}$ , respectively. Mild ( $5 \leq \text{UIC} < 10 \mu\text{g}/\text{dl}$ ) and moderate ( $2 \leq \text{UIC} < 5 \mu\text{g}/\text{dl}$ ) iodine deficiency was detected in 6.4 and 3.2% of cases, respectively. Only 1.8% of children were severely iodine deficient ( $\text{UIC} < 2 \mu\text{g}/\text{dl}$ ).

Although the mean  $\pm$  SD of USCN in goitrous children ( $N=59$ ) was higher than USCN in non-goitrous ones ( $N=88$ ), the difference was not statistically significant ( $0.75 \pm 0.78 \text{ mg}/\text{dl}$  vs.  $0.63 \pm 0.40 \text{ mg}/\text{dl}$ ;  $p=0.30$ ). The prevalence of high USCN ( $\text{USCN} > 0.9 \text{ mg}/\text{dl}$ ) in goitrous and nongoitrous children was 25.4 and 18.2%, respectively ( $p=0.29$ ).

The results of the present study indicate that goiter is still endemic in this region, and there is no biochemical iodine deficiency or no inadequacy in iodine intake in Semirom population. We finally concluded that SCN overload might not contribute to the residual goiter in the studied children. Further investigations are required to find the role of other possible goitrogens in the etiology of goiter in Semirom schoolchildren.

AMMAR HASSANZADEH KESHTELI,<sup>a,b</sup> MAHIN HASHEMPOUR,<sup>b</sup> MASOUD AMINI,<sup>b</sup> MANSOUR SIAVASH,<sup>b</sup> ASHRAF AMINORROAYA,<sup>b</sup> HASSAN REZVANIAN,<sup>b</sup> ALI KACHUEI,<sup>b</sup> and ROYA KELISHADI<sup>c</sup>

<sup>a</sup>Medical Students' Research Center, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran, <sup>b</sup>Isfahan Endocrine and Metabolism Research Center, Isfahan University of Medical Sciences, Isfahan, Iran and <sup>c</sup>Isfahan Cardiovascular

Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

doi:10.1093/tropej/fmp096

Advance Access Published on 1 October 2009

## References

1. Knudsen N, Laurberg P, Perrild H, *et al.* Risk factors for goiter and thyroid nodules. *Thyroid* 2002;12:879–88.
2. Erdogan MF. Thiocyanate overload and thyroid disease. *Biofactors* 2003;19:107–11.
3. Marwaha RK, Tandon N, Gupta N, *et al.* Residual goitre in the postiodization phase: iodine status, thiocyanate exposure and autoimmunity. *Clin Endocrinol* 2003;59:672–81.
4. Virion A, Deme D, Pommier J, *et al.* Opposite effects of thiocyanate on tyrosine iodination and thyroid hormone synthesis. *Eur J Biochem* 1980;112:1–7.
5. Laurberg P, Andersen S, Knudsen N, *et al.* Thiocyanate in food and iodine in milk: from domestic animal feeding to improved understanding of cretinism. *Thyroid* 2002;12:897–902.
6. Siavash Dastjerdi M, Hashemipour M, Rezvanian H, *et al.* Iron deficiency in goitrous schoolchildren of Semirom, Iran. *Horm Res* 2006;66:45–50.
7. Pino S, Fang SL, Braverman LE. Ammonium persulfate: a safe alternative oxidizing reagent for measuring urinary iodine. *Clin Chem* 1996;42:239–43.
8. Michajlovskij N, Langer P. The relation between thiocyanate formation and the goitrogenic effects of foods. I. The preformed thiocyanate content of some foods. *Z Physiol Chem* 1958;312:26–30.

## Acknowledgements

This work was supported by the Vice Chancellery for Research, Isfahan University of Medical Sciences. We are thankful to the authorities of the provincial and local education offices, and all the staff working with the project, students and their parents. We also wish to thank Mehrdad Makaremi for his contribution in preparing the final manuscript.

Correspondence: Mahin Hashemipour, Isfahan Endocrine and Metabolism Research Center, Isfahan University of Medical Sciences, Sedigheh Tahereh Medical Research Complex, Khorram Street, Isfahan, Iran.  
E-mail: <hashemipour@med.mui.ac.ir>.