Increased paraoxonase and arylesterase activity in thyroiditis patients compared to healthy individuals

S.S.K. Marasinghe 1, R. Sivakanesan 2
1 Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka
2 Department of Biochemistry, University of Peradeniya, Peradeniya, Sri Lanka
E-mail address: sanjila.marasinghe@gmail.com
(S.S.K. Marasinghe).

Aim: The aim of this study was to assess whether there is a significant difference in paraoxonase and arylesterase activities and distribution of phenotypes in thyroiditis patients compared to healthy volunteers.

Introduction: Human serum paraoxonase 1 (PON1; EC3.1.1.2) is an antioxidant enzyme showing both paraoxonase and arylesterase activities. The PON1-192 polymorphism has two isoforms, namely PON1 Q and PON1 R. PON1 Q contains a glutamine at position 192. PON1 R contains an arginine at position 192. It shows a 6 fold higher activity towards paraoxon hydrolysis compared to Q isofrom. Arylesterase activity is similar in both isoforms. The R allele shows a greater degree of stimulation of its paraoxon- hydrolyzing activity by 1 M NaCl than does the Q allele. The ratio of Salt stimulated PON 1 activity/Arylesterase activity (P/A ratio) is trimodally distributed. The three modes correspond to paraoxonase phenotypes, QQ, QR and RR.

Methods: Fifty thyroiditis patients and one hundred and thirty seven apparently healthy individuals were enrolled in this study. Serum samples of both groups were analysed for basal paraoxonase activity, salt stimulated paraoxonase activity (with 1 M NaCl) and arylesterase activity (spectrophotometrically). P/A ratio was used to assess the phenotypes (dual substrate method).

Results: Basal PON 1 activity (205.27 ± 115.00 U/l vs. 251.1 ± 129.6 U/l, p = 0.002) and arylesterase activity (159.53 ± 37.11 vs. 177.59 ± 46.90, p = 0.024) was significantly higher in thyroiditis patients compared to healthy volunteers. Percentage of QQ phenotype was significantly higher in thyroiditis patients compared to healthy individuals. Percentage of QR phenotype was significantly lower in thyroiditis patients compared to healthy individuals. There was no difference in percentage of RR phenotype in thyroiditis patients and healthy individuals.

Conclusion: Serum PON 1 activity and arylesterase activity was significantly higher in thyroiditis patients compared to healthy individuals. Percentage distribution of phenotypes in thyroiditis patients was significantly different from healthy individuals.

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