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Increased glutathione reductase activity in colorectal cancer

Farnaz Zahedi Avval, Shima Lorestani, Majid Mojarrad, Seyyed Isaac Hashemy, Ali Bahari, Mahdi Asadi, Mohammad Keyvanloo and Tayebeh Kianoush
Mashhad University of Medical Sciences, Iran

Background & Aim: Glutathione reductase (GR) is an important enzyme in oxidative metabolism providing reduced glutathione (GSH) from its oxidized form (GSSG) in the cells. The aim of this study was to compare gene expression and enzymatic activity of GR in tumor and resection margin of colorectal cancer (CRC) tissue, one of the most common malignancies in human.

Methods: This investigation included 15 CRC samples. The study was approved by the local ethics committee and written informed consent was obtained from all patients before surgery. No additional procedure was performed for sampling. RNA was extracted from colon fresh tissues including tumoral and anatomically normal marginal tissue. Expression of GR gene was determined using real time PCR by $\Delta\Delta C_t$ relative quantification method. The result of gene expression was standardized with Glyceraldehyde 3-phosphate dehydrogenase (GAPDH) as endogenous reference gene. In addition enzyme activity of GR was measured with a commercial kit (Cayman, Cat no.703202).

Results: Tumor tissue samples showed higher expression levels than resection margins. Based on paired-sample t Test, the difference between the two groups was significant (P-value=0.005). Also the data showed that GR enzyme activity in tumoral tissue (116.9 ± 34.31) was significantly higher than marginal tissue (76.7 ± 36.85 nmol/min/ml) (P-value=0.003).

Conclusion: We showed an increased GR expression and enzyme activity in CRC tumoral tissue. Given the role of glutathione in synthesis of dNTPs for DNA repair with glutaredoxin system, increasing of GR expression and activity might indicated a possible role of this enzyme in DNA synthesis and repair in colorectal cancerous cells.

Biography

Farnaz Zahedi Avval has got her MD from Mashhad University of Medical Sciences, Iran. She completed her PhD from Karolinska Institute, Sweden. She has published several papers in reputed journals and has been serving as an Assistant Professor in Clinical Biochemistry at Mashhad University of Medical Sciences, Iran.

ZahediAF@mums.ac.ir

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