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Quantitative detection of nitric oxide (NO) in apoptosis of esophageal carcinoma cell induced by arsenite

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Abstract

AIM: To determine NO, NO synthase (NOS) and NOSmRNA of the esophageal carcinoma cells (SHEEC1) in apoptotic process induced by As_2O_3 and to explore the relationship between NO and apoptosis.

METHODS: The apoptosis of the cell line (SHEEC1) was induced by arsenite (As_2O_3, 5 μmol/L and 10 μmol/L). In the process, at 2 h, 4 h, 8 h, 16 h and 24 h after administration of As_2O_3, NO production in cultural medium was detected quantitatively by spectrophotometry; NOSⅡ was detected by immunohistochemistry and NOS mRNA by *in situ* hybridization (ISH). The cells at endpoint of the experiment were examined under transmitted electron microscope (TEM) for apoptosis.

RESULTS: The amount of NO released from SHEEC1 were increased from the basal condition (0.68×10^{-2} μmol/L) up to the high level (2.38×10^{-2} μmol/L) at h 16. The increment of NOSⅡ was found after administration of As_2O_3; the intracytoplasmic ISH signals of NOSmRNA in small size was found firstly at 4 h, and then became highly predominant. Apoptotic changes of SHEEC1 occurred at 24 h under TEM.

CONCLUSION: After administration of As_2O_3, NO released from cultured SHEEC1 cells was detected with increasing amount up to 16 h. The expression of NOSⅡ and transcription of NOSmRNA are upregulated. The present findings suggest a concept that the NO may be a mediated and effective factor in apoptosis induced by As_2O_3.

Key words: Nitric oxide; Esophageal neoplasms; Apoptosis; Arsenic; Immunohistochemistry; In site; Hybridization; Microscopy, electron

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