

## Phagocytic Activity and Nitric Oxide Production of Circulating Polymorphonuclear Leukocytes from Patients with Peritoneal Carcinomatosis

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Many studies have demonstrated an increase of neutrophils in patients with advanced cancer. However, the possible role of increased neutrophils in various neoplasms studied to date varies considerably. The authors examined the changes in white blood cell counts in patients with peritoneal carcinomatosis. Malondialdehyde and nitric oxide (NO) plasma and ascitic fluid levels, phagocytic activity and the ability of the polymorphonuclear cells (PMNCs) to produce nitric oxide were also measured. An increase in PMNCs and decrease in lymphocytes was found in cancer patients. Compared with healthy controls, cancer PMNCs showed significant enhancement of phagocytosis. Similarly, pretreatment of healthy PMNCs with crude supernatants from short-term cultures of the peritoneal cells from ascitic fluid of patients with peritoneal carcinomatosis caused marked stimulation of PMNC phagocytosis. In addition, plasma and ascitic fluid nitric oxide levels in cancer patients were significantly higher than those found in control one. Most importantly, it was found that PMNCs from cancer patients release significantly more nitric oxide than corresponding normal controls. Therefore, considering the fact that neutrophils make up more than 50% of total leukocytes, these cells can play one of the most important roles in tumor biology.

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In cancer, numerous cellular and humoral elements of the immune system are activated and coordinately contribute to disease pathology. It has been known for a long time that mononuclear cells infiltrate tumor tissue. Although tumor-infiltrating mononuclear cells have been extensively studied over the past two decades, immunologists seeking new ways to treat cancer progression commonly overlook polymorphonuclear cells. However, it has been reported from clinical trials that an increase of leukocytes, mainly neutrophils, is noted in patients with advanced cancer (1). Moreover, some studies have shown that PMNC may infiltrate tumor tissue (2–4). Yet, neutrophils inhibited growth of one but stimulated growth of other tumors (5). Thus far, however, the roles of PMNC in the tumor-bearing host are still unclear.

### MATERIAL AND METHODS

#### Patients

We analysed a group of 10 patients with peritoneal carcinomatosis, none of whom had received any chemo-, radio-, or endocrine therapy during the last three months. The control group consists of 10 healthy individuals and 10 stable patients on continuous ambulatory peritoneal dialysis. Abnormal peritoneal situations were excluded by blood cell count, peritoneal functional data, nocturnal peritoneal effluent cell population and bacterial culture.

#### Preparation of PMNC

Polymorphonuclear cells were isolated from heparinized venous blood using a density gradient (Lymphoprep 1.077,









