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ANTIOXIDANT EFFECT OF ASTAXANTHIN ON PERITONEAL FIBROSIS IN CHRONIC KIDNEY DISEASE WITH CONTINUOUS AMBULATORY PERITONEAL DIALYSIS

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Objectives: One of the long-term complications of CAPD is peritoneal fibrosis (PF) due to ceaseless dialysate exposure. Hyperglycemic, acidic and hyperosmotic dialysate environment cause inflammation and vascular changes that lead to fibrosis. Astaxanthin (AST) is natural carotenoid with anti-oxidant and anti-inflammatory properties which attenuate fibrosis. We aimed to investigate the effect of AST on PF in CAPD.

Methods: Twenty-four CKD rats (*Rattus novergicus*) treated with CAPD divided into 3 groups: control negative (NaCl 0.9% intra-peritoneal injection), control positive (4.25% dialysate intra-peritoneal injection), intervention group (4.25% dialysate intra-peritoneal injection+oral AST 0.216 mg/kgBW for 21 days). Peritoneal tissue and fibrosis marker including malondialdehyde (MDA) and angiotensin II (Ang II) were evaluated using immunohistochemistry and histopathological examination.

Results: The mean MDA level of control negative, control postive, and intevention group were 9.24±0,18 mmoL/mL, 9,99±0,75 mmoL/mL, and 2,68±0,75 mmoL/mL, respectively ($p < 0,05$). The mean Ang II concentration were 149.43±2.98 pg/mL, 149.62±2.95 pg/mL and 64.76±0.37 pg/mL for each group ($p < 0.05$). It showed that concentration of both marker were significantly reduced within group treated with AST. The antioxidant effect of AST was also associated with ameliorated fibrosis alteration seen as reduced peritoneal membrane thickness in CAPD rats' peritoneal tissue ($p < 0.05$).

Conclusions: Our results concluded that AST has protective effect on peritoneal fibrosis progression by diminishing oxidative stress and inflammation in CAPD. Furthermore, this protective effect against inflammation and fibrosis may improve adequacy in CAPD as well.

Table of Statistical Analytic Results

Table 1. The Results of the Statistical Analysis of ROS (mmoL/L) by Groups

Group	n	Mean ± Standart Deviation	P value
Control negative	8	9.24 ± 0.18	
Control positive	8	9.99 ± 0.09	0.000
Intervention	8	2.68 ± 0.07	

Table 2. The Results of the Statistical Analysis of Angiotensin II (pg/mL) by Groups

Group	n	Mean ± Standart Deviation	P value
Control negative	8	149.43 ± 2.98	
Control positive	8	149.62 ± 2.95	0.000
Intervention	8	64.76 ± 0.37	

Table 3. The Results of the Statistical Analysis of Fibrosis Thickness (micrometer/field) by Groups

Group	n	Mean ± Standart Deviation	P value
Control negative	8	17.46 ± 2.96	
Control positive	8	43.09 ± 6.72	0.006
Intervention	8	21.47 ± 6.47	