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Serum Levels of Heavy Metals in Cholangiocarcinoma Patients from the Nile Delta Region of Egypt: A Single Centre Study

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Abstract

Background: In Egypt, newly diagnosed cases of cholangiocarcinoma are increasing annually. Several reports from Nile Delta show high levels of heavy metals and organocholorine pesticides in the soil and water. We assess serum levels of Heavy metals (Zinc (Zn), lead(Pb), Cobalt (Co), Cadmium (Cd),Chromium (Cr) and Iron(Fe)) as markers of exposure in cholagiocarcinoma patients and healthy controls from the Nile Delta in Egypt and its correlation with tumor differentiation and tumor marker CA 19-9.

Methods: We included 45 cholangiocarcinoma patients and 20 healthy controls. All patients and controls were permanent residents of North Delta region and were recruited before receiving chemotherapy or radiotherapy, with no restrictions based on age, sex, or tumor stage.

Results: The serum levels of Zn, Pb, Co, Cd and Fe were significantly higher in cholangiocarcinoma patients than controls ($P = 0.001$).A significant higher serum level of Pb was found in patients with well differentiated to moderately differentiated to undifferentiated tumors ($P < 0.05$).Cd has a positive correlation with CA19-9 and negative correlation with patients' survival ($P<0.5$, $P<0.01$ respectively).

Conclusions: Cholangiocarcinoma in the Nile Delta region is significantly associated with high serum levels of heavy metals especially Cadmium and lead.

Key words: cholangiocarcinoma, Nile Delta region, heavy metals, lead, Cadmium