Role of hypermethylation of RASSF1A & Protocadherin-10 promoter regions as molecular diagnostic and prognostic markers in Egyptian breast cancer patients

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**Background:** DNA hypermethylation is an epigenetic change that blocks the promoter region of a gene resulting in gene silencing. In breast cancer, many hypermethylated genes have been reported such as RASSF1A and PCDH10 tumor suppressor genes.

**Aim:** To evaluate the diagnostic and prognostic role of serum RASSF1A and PCDH10 promoters hypermethylation in Egyptian breast cancer patients.

**Subjects and methods:** This study was conducted on 80 breast cancer patients and 40 normal healthy controls. Methylation specific PCR was used to investigate the promoter methylation status of serum RASSF1A and PCDH10 genes.

**Results:** No hypermethylation of the two genes detected in serum DNA of normal healthy controls (100% specificity). Of the 80 patients, 50 patients (62.5% sensitivity) displayed hypermethylated RASSF1A, 34 patients (42.5% sensitivity) showed hypermethylated PCDH10 and 64 (80% sensitivity) were hypermethylated in at least one of these two genes. Hypermethylated RASSF1A was significantly associated with axillary lymph node involvement. Hypermethylated PCDH10 was significantly associated with axillary lymph node involvement, tumor size and pathological grade. Furthermore, hypermethylated RASSF1A and/or PCDH10 combination was significantly associated with axillary lymph node involvement and Her-2 expression. Patients with methylated RASSF1A or PCDH10 had survival time significantly shorter than those with unmethylated RASSF1A or PCDH10.

**Conclusion:** Methylated RASSF1A is superior to methylated PCDH10 in the diagnosis of breast cancer patients. The addition of methylated PCDH10 to methylated RASSF1A significantly improves the diagnostic accuracy of RASSF1A alone. Methylated RASSF1A or PCDH10 is more powerful than combined methylated RASSF1A and/or PCDH10 in predicting the clinical outcome of breast cancer patients.

**Biography**

Taha Ismail Hewala has completed his Ph.D. at the age of 31 years from Alexandria University and Assistant Professor in the field of cancer diagnosis and therapy at the age of 36 from Alexandria University. He is the head of Radiation Sciences Department, Medical Research Institute, Alexandria University. He has published 8 papers in different international and local journals.

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