mRNA Expression of E-cadherin and Vimentin and p53 immunohistochemistry in epithelial ovarian cancer

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AIM AND OBJECTIVES

Aim: To correlate mRNA and protein expression of E-cadherin and Vimentin and study surgico-pathological extent of epithelial ovarian cancers

Objectives

1.To analyze mRNA expression of E-cadherin and Vimentin in epithelial ovarian cancer. 2.To compare protein expression by immunohistochemistry of E-cadherin and Vimentin in malignant and benign epithelial ovarian tumor.. 3.To type epithelial ovarian cancer by p53 immunostaining and to correlate with above markers. 4. To study the clinical profile and surgico-pathological extent of ovarian cancer

MATERIAL AND METHOD

Study design & Duration- Case control study, November 2016 to April 2018.

Sample size- Sample size was calculated from a previous study which showed that SD for E-cadherin was three and one and mean was 7.58±2.97 and 1.61±1.17 for benign and malignant ovarian tumors respectively. (Wu DI, et al. Oncol Lett 2016;11:1463-8)

Taking difference of 2 as clinically important between benign and malignant, 22 benign and 22 malignant cases with 80% power and 5% level of significance were recruited.

RESULTS

Demographic data in malignant and benign epithelial ovarian tumour

Parameters	Malignant epithelial ovarian tumour	Benign epithelial ovarian tumour
Age (Yr) (Mean± SD) range	46.50(SD± 11.73) (26-62)	41.32 (SD ± 15.19) (16-72)
Parity	Nulliparous	27.3% (n=6)
	Multiparous	9% (n=2)
		72.7% (n=16)
		91% (n=17)
Age at menarche (Yr) (Mean± SD) Range	14.29(SD± 1.45)	14.18(SD±1.1)
Age at menopause (Yr) (Mean± SD) Range	49.7(SD ± 3.43) (45-54)	47.44(SD ± 5.73) (40-58)
Positive Family history of malignancy	0.09 % (n=2)	0.09 % (n=2)
Ovulation induction agents	4.55% (n=1)	4.55% (n=1)
Oral contraceptive pills	4.55% (n=1)	0

p53 expression in serous epithelial tumour

	p53 positive	p53 negative
High grade serous carcinoma (n=11), n (%)	90.90%(10)	9.09%(1)
Low grade serous carcinoma (n=4), n (%)	0	100% (4)

p53 showing focal positivity (low grade carcinoma) (IHC)

p53 positivity in high grade carcinoma (IHC)

Extent of surgery in malignant epithelial ovarian tumour

Extent of surgery	No. of patients* (n=22)
TAH with BSO	19
Extra-peritoneal TAH with BSO with anterior and posterior peritonectomy	2
Pelvic lymphadenectomy	7
Pelvic and para-aortic lymphadenectomy	6
Infracolic omentectomy	18
Total omentectomy	3
Appendicectomy	3
Anterior resection of recto-sigmoid	2

Peritoneal carcinomatosis index (PCI) & completeness of cytoreductive score

Peritoneal Carinomatosis index (PCI)*	
PCI < 10	83.33%(n=10)
PCI ≥ 10	16.66% (n=2)
Completeness of Cytoreductive Score (CCS)	
CC-0	90.90% (n=20)
CC-2	4.55% (n=1)
CC-3	4.55% (n=1)

*PCI was calculated for advanced stage epithelial ovarian cancer

Correlation coefficient between PCI and CCS was 0.495, indicating positive correlation in PCI and CCS and P-value of less than 0.0193

mRNA expression of E-cadherin and vimentin in malignant vs. benign tumors

m-RNA expression (ΔCt value)	True fold change	p-value
E-cadherin	-2.126	0.023
Vimentin	2.733	0.001

IHC expression of E-cadherin and Vimentin

IHC expression (IRS)	Malignant epithelial tumor (n=22) (Mean ± S.D.)	Benign epithelial tumor (n=22) (Mean ± S.D.)	p-value
E-cadherin	163.64(SD ±87.21)	185.91(SD ±108.35)	0.387
Vimentin	154.54(SD ±103.9)	64.09(SD ±112.91)	0.007

Serous cystadenoma showing strong positivity for E-cadherin (IHC 100x)

Serous cystadenoma negative for vimentin (IHC)

Low grade serous carcinoma showing moderate intensity of E-cadherin positivity (IHC)

High grade carcinoma showing strong positivity for vimentin (IHC)

CONCLUSION

- Expression of E-cadherin decreased and vimentin increased in epithelial ovarian cancer as compared to benign epithelial tumours in synchrony with EMT pathway hypothesis.
- p53 IHC to type serous carcinoma into type I & II as recommended by WHO.
- Complete cytoreduction (CC0) was achieved in all women when peritoneal carcinomatosis index (PCI) was less than 10
- No correlation was obtained between EMT markers and metastatic deposits, lymph node or bowel involvement.
- Insights into tumorigenesis and metastatic potential may ultimately lead to improved survival and new drug targets