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Fascin expression in breast cancer

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***Abstract*---**Background: The present study was conducted for assessing Fascin expression in breast cancer patients. Materials & methods: A total of 50 patients diagnosed histopathologically with breast cancer were enrolled. Complete demographic details of all the subjects were recorded. Clinical and radiographic examination of all the subjects was done. Blood samples were obtained from all the subjects and biochemical along with haematological profile was assessed. Lymph node status in all the patients was evaluated. Fascin expression was assessed in all the patients. Results: Fascin expression was positive in 36 percent of the patients. Mean age of the patients with positive and negative Fascin expression was 52.3 percent and 55.4 percent respectively. Lympho-vascular expression was present in 66.67 percent and 50 percent of the patients with Fascin positive and negative expression respectively. Lymph node involvement was present in 72.22 percent and 62.5 percent of the patients with Fascin positive and negative expression respectively. Conclusion: Fascin expression in breast cancer cells offers a potential therapeutic intervention in breast cancer treatment.

***Keywords*---**Fascin, Breast, Cancer.

Introduction

Breast cancer is the most common cancer diagnosed in women, accounting for more than 1 in 10 new cancer diagnoses each year. It is the second most common cause of death from cancer among women in the world. Anatomically, the breast has milk-producing glands in front of the chest wall. They lie on the pectoralis major muscle, and there are ligaments support the breast and attach it to the chest wall.[1, 2] A personal history of breast cancer is also a significant risk factor for the development of a second ipsilateral or contralateral breast cancer. In fact, the most common cancer amongst breast cancer survivors is a metachronous contralateral breast cancer.[3, 4]

Mastectomy and chemotherapy have greatly improved the survival of breast cancer patients and more elegant forms of surgical procedures are now being applied to minimize the post-treatment psychological impact. However, without fully understanding the underlying mechanism and pathogenesis, the efficiency of prevention and treatment will always be limited.[5, 6] Fascin is an actin-bundling protein that promotes cancer cell migration and invasion. By contrast, breast cancer metastasis suppressor 1 (BRMS1) inhibits cancer metastasis by targeting multiple steps of the metastatic cascade.[7, 8] Hence; the present study was conducted for assessing Fascin expression in breast cancer patients.

Materials & Methods

The present study was conducted for assessing Fascin expression in breast cancer patients. A total of 50 patients diagnosed histopathologically with breast cancer were enrolled. Complete demographic details of all the subjects were recorded. Clinical and radiographic examination of all the subjects was done. Blood samples were obtained from all the subjects and biochemical along with haematological profile was assessed. Lymph node status in all the patients was evaluated. Fascin expression was assessed in all the patients. All the results were recorded in Microsoft excel sheet and were analysed by using SPSS software.

Results

Mean age of the patients was 54.2 years. Out of 50 patients, Fascin expression was positive in 36 percent of the patients. Mean age of the patients with positive and negative Fascin expression was 52.3 percent and 55.4 percent respectively. Lympho-vascular expression was present in 66.67 percent and 50 percent of the patients with Fascin positive and negative expression respectively. Lymph node involvement was present in 72.22 percent and 62.5 percent of the patients with Fascin positive and negative expression respectively.

Table 1: Fascin expression

Fascin expression	Number	Percentage
Positive	18	36
Negative	32	64
Total	50	100

Table 2: Correlation of Fascin expression with metastatic and demographic variables

Variable	Fascin Positive	Fascin negative	p- value
Mean age (years)	52.3	55.4	0.180
Lympho-vascular invasion (%)	66.67	50	0.001*
Lymph node involvement (%)	72.22	62.5	0.001*

*: Significant

Discussion

Breast cancer refers to cancers originating from breast tissue, most commonly from the inner lining of milk ducts or the lobules that supply the ducts with milk. Breast cancer is about 100 times more common in women than in men, although males tend to have poorer outcomes due to delays in diagnosis. Cancer cells are very similar to cells of the organism from which they originated and have similar (but not identical) DNA and RNA. This is the reason why they are not very often detected by the immune system, in particular, if it is weakened.[5, 6]

Breast cancer is of the most important factors that risk physical, mental, and social health of women. Some therapeutic complications affect the patient's self-awareness, self-confidence, and sense of self-worthlessness and -acceptance. Suffering from disease, concerning about family future, fear of death, therapeutic complications, reduced performance, and mental imagery disorder are among factors that impair the mental health of patients with breast cancer.[7- 9] Hence; the present study was conducted for assessing Fascin expression in breast cancer patients.

Mean age of the patients was 54.2 years. Out of 50 patients, Fascin expression was positive in 36 percent of the patients. Lee HJ et al evaluated whether expression patterns of fascin and BRMS1 correlate with clinicopathological features and patient outcome. Immunohistochemistry for fascin and BRMS1 was performed using a tissue microarray constructed from 183 human breast cancer tissues. Fascin expression determined by the proportion of stained tumor cells (0: 0-5%, 1: 6-25%, 2: 26-50%, 3: 51-75%, or 4: >75%) and staining intensity (0: negative, 1: weak, 2: moderate, or 3: strong) were multiplied and defined as negative (0-3) or positive (4-12). BRMS1 expression was scored separately based on nuclear and cytoplasmic staining intensity (0: negative, 1: weak, 2: moderate, 3: strong). We obtained the BRMS1 H score by summing the nuclear and cytoplasmic scores and defined it as negative (0-2) or positive (3-6). Expression of BRMS1 showed a significant inverse correlation with that of fascin. Fascin+ tumors were significantly associated with no lymph node metastasis, higher histological and higher nuclear grade, ER/PR/HER2 negativity, and triple-negative subtype (all ps < 0.05). These clinicopathological differences showed the same trend in a comparison of fascin-/BRMS1+ and fascin+/BRMS1- tumors. Negative or weak BRMS1 cytoplasmic expression was significantly associated with shorter disease-free survival. Fascin positivity was significantly associated with shorter DFS and overall survival when analyses were confined to node-negative

patients. Their study confirmed an inverse correlation between expression of fascin and expression of BRMS1 using a quite large cohort of human breast cancer tissues.[12]

Lympho-vascular expression was present in 66.67 percent and 50 percent of the patients with Fascin positive and negative expression respectively. Lymph node involvement was present in 72.22 percent and 62.5 percent of the patients with Fascin positive and negative expression respectively. Yoder BJ et al investigated the expression of fascin, an actin-bundling motility-associated protein, in 210 invasive breast carcinomas with corresponding 5-year clinical follow-up. Fascin expression was compared with hormone receptor (ER/PR) status, HER2 status, cancer grade, cancer stage, metastasis pattern, disease-free survival, and overall survival. Fascin expression was seen in 16% (33/210) of the cases and correlated with ER negativity (22/33, $P < 0.001$), PR negativity (21/33, $P < 0.001$), Bloom-Richardson grade 3 (19/29, $P < 0.001$), and advanced stage (stage 3 or 4, $P = 0.04$). There was no correlation between fascin expression and HER2 status or pattern of metastases. Patients whose tumors were positive for fascin showed both a decreased mean disease-free survival (74.44 versus 100.52 months, $P = 0.002$) and mean overall survival (77.58 versus 98.98 months, $P = 0.002$), independent of tumor stage and HER2 status, but not independent of ER/PR status or cancer grade. Given fascin's role in altering cell motility, overexpression may contribute to a more aggressive clinical course in ER/PR-negative breast cancers.[11]

Conclusion

Fascin expression in breast cancer cells offers a potential therapeutic intervention in breast cancer treatment.

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