Evaluation of Antiperspirant Agents Effect on the Size of Axillary Lymph Nodes in Iranian Women

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ABSTRACT

Introduction: Size of axillary lymph nodes can be a predictor for breast abnormalities. The agents in the antiperspirants such as Aluminum were observed in the breast biopsy of individual with abnormalities and antiperspirants usage. In this study, the relation between using antiperspirants and the size of axillary lymph nodes were evaluated in Iranian women.

Methods: In this study, 120 women were enrolled and asked for using the antiperspirant agents. Then ultrasound and mammography were taken from these cases and axillary lymph nodes were measured in both sides. Then, the sizes were compared in the cases with regular use of antiperspirants and without use of these agents.

Results: In the present study, 120 normal women were studied. Mean age of sample group was 38.02 and all samples were female. Seventy eight cases (65%) used antiperspirant agents as usual and 42 cases (35%) did not. There were no significant differences between age, right and left nodes size of the cases with and without the use of antiperspirant agents ($P \leq 0.05$).

Conclusion: The results confirmed that size index is not a sufficient factor for malignancy and using antiperspirant wasn't producing abnormal statue in axillary lymph nodes and node with large size wasn't from lymphadenopathy or malignancy in Iranian women.

1. Introduction

Axillary lymph nodes drain lymph from the lateral quadrant of the breast, superficial lymph vessel from the wall of the chest and the abdomen above the level of navel and the vessels from the upper limb. Several groups were defined according to their location in armpit [1]. In the breast cancer, these nodes are significant and metastases from the breast to the axillary lymph nodes can be observed. Axillary lymph nodes are the place of about 75% of lymph drainage from breast and it's important for diagnosis of breast malignancies [2].

Axillary lymph nodes have been increased under influence of some factors such as bacterial and viral infection, hormonal disease, weight gain, silicon implant, melanoma and lymphoma. There is controversy about the size and

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effect of lymph node abnormality [3]. Some researchers claim that size index is not sufficient for malignancy diagnosis, because lymph nodes size may be affected by inflammatory or infection disease and some believe that nodes are generally considered to be normal if they are up to 1 cm in diameter [4, 5].

Nowadays, using hygiene compound is developing in the societies. Antiperspirants are considered because of some agents in their compound such as aluminum and semi estrogen and are used in area that is adjacent to upper lateral quadrant near to axillary lymph nodes. These agents can be absorbed through the skin and are not excreted through sweet [6]. They hurt apical sweet duct cells and makes epigenetic changes in cells [7].

Aluminum salts approximately forms 25% of antiperspirant volume that each time used. In addition, 12% of Aluminum is absorbed by cells in axillary region [8], and absorbed materials have been observed in the breast biopsy of individual who used antiperspirant [9].

with regard to increasing level of breast malignancy and involvement axillary lymph nodes and also considering the increase in using hygiene antiperspirant that often contain aluminum salts, this study was conducted to measure the axillary nodes size in Iranian females and to compare the size of these nods in cases with and without antiperspirant usage.

2. Materials & Methods

This study is cross-sectional and semi-experimental study which is applied on 120 women. The women who referred to radiologic clinic from April 2014 to June 2015 enrolled in the study, and were divided into two groups of with and without antiperspirant usage.

In this study, individuals with reddish skin and infection and also those who used hormonal and anti-pregnancy drugs were excluded. In addition, patients with breast and axillary node malignancies were excluded. All patients were examined by a single surgeon.

In all patients, ultrasound with special female breast probe was performed for evaluation of lymph nodes via MHz linear array transducers (Sonoline Elegra Advanced, Siemens, Erlangen, Germany). Mammography was also applied by radiologist and via Estrogen mylabe 50.X.vision set. Benign nodes were considered as small size, oval shape, with moderate presence of Hilum and sharp margin with same density and absent calcified point. Malignant tumors were considered as large size, round shape, with marked hypoechoic presence of Hilum and irregular margin. By using radiologic images and ultrasound, lymph nodes size was calculated and reported as Mean±standard deviation (SD). T-test was used for data analysis and $P<0.05$ was considered as significant level.

3. Results

In the present study, 120 normal subjects were studied. Mean age of sample group was 38.02 and all subjects were female. Mean, standard deviation, maximum and minimum of right and left axillary nodes are mentioned in Table 1. Seventy eight cases (65%) used antiperspirant agents as usual and 42 cases (35%) did not. According to Table 2, there were no significant differences between age, right and left nodes size of the cases with and without the use of antiperspirant agents.

4. Discussion

Axillary lymph nodes are important because they drain lymph of thoracic wall and upper limb and also they are so close to breast and contingency of breast malignancy can be invasive to this area. Meanwhile axillary lymph nodes size are noteworthy as a diagnostic criterion [10].

As regards nowadays using of hygiene compounds such as antiperspirant and deodorant has been developed in various societies and these compounds are used in area that is adjacent to upper lateral quadrant. The relation between these compounds usage and axillary lymph nodes malignancy is not confirmed in recent studies [11-13].

According to the results, the size of lymph nodes was similar in subjects with and without antiperspirant usage.

Table 1. Age, right and left nodes size of all cases with and without antiperspirant usage.

	Mean	Minimum	Maximum	SD
Age	40.02	21.00	65.00	10.39
Right node (mm)	21.34	12.00	35.00	4.81
Left node (mm)	21.32	5.00	40.13	4.87

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Table 2. Age, right and left nodes size of the cases with and without antiperspirant usage.

	Antiperspirant	N	Mean	SD	P-value
Age	yes	78	43.12	7.41	0.432
	no	42	44.47	6.24	
Right node (mm)	yes	78	20.99	4.36	0.175
	no	42	22.6	6.15	
Left node (mm)	yes	78	21.23	5.18	0.697
	no	42	21.61	3.55	

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Based on Kaur et al. (2013) studies, applied on 97 patients, 35 individuals with axillary lymph node size of 0.4-1.6 cm had benign tumor and unfortunately 62 patients suspicious for metastatic disease had possessed 0.84-2 cm lymph nodes before they were examined. After that 44 individuals had malignancy and other 18 individuals were healthy. This study declared that axillary lymph node size was unreliable predict factor [14].

Madjar et al. (2008) declared that axillary lymph node size more than 10 mm isn't a good sign for malignancy and the sizes offered for normal lymph node and metastatic is various. Mean size for non-involved lymph nodes is 6.5 mm and size of 1.8-40.6 is mentioned for metastatic lymph nodes [15].

The greater nodes are more susceptible for getting metastatic than smaller node. In this study, it was recorded that the nodes which have the size of 30 mm and higher were completely normal.

In an examination of individuals suspicious to abnormality that was applied in American college radiology, lymph nodes size with benign outcome was 0.9–3.5 cm and in patient with malignancy outcome, it was 1.2-9 cm [16]. Also, in study applied in Vienna University, it was declared that metastatic possibility for nodes with less than 5 mm diameter is 10%. In addition, this possibility is 20% (slightly increased) for nodes with 5-20 mm diameter and for nodes large than 20 mm is 40% [17].

In addition, in a study which was carried out in American on 813 patients with breast cancer and 793 healthy individuals, it was shown that there is no relation between using antiperspirant or deodorant and breast cancer [17].

Another study in America has reported that there is no difference in Aluminum concentration between area of cancer spread and its surrounding tissue [6]. Based on the study that was carried out in 2013, amount of concentrated Aluminum has not difference in malignant or normal tissue [18].

In the study which was performed in 2007, high level of Aluminum was observed in breast tissue and surrounded lipid during biopsy from upper-lateral quadrant (the area is closed to region of using antiperspirant) [19]. However, a study in 2014 expressed that Aluminum was interferes in epithelial cell biological function, and causes cascade of changes that is a sign of beginning of malignant phase [20].

In this study, there isn't any significant relation between using antiperspirant and size and shape of nodes. According to the results, using antiperspirant has no clear relation with axillary lymph nodes. However, the agents in the antiperspirant have genotoxic character and thus, it was suggested to do more studies in this area.

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