Original Article

The Correlation between the Family Levels of Socioeconomic Status and Stage at Diagnosis of Breast Cancer

Pegah Mohaghegh[1,2], Parvin Yavari[1,2], Mohammad Esmail Akbari[2], Alireza Abadi[1], Farzane Ahmadi[3]

Abstract

Background: Stage is one of the most important prognostic factors for the cancer diagnosis, including the breast cancer. Studies have found that the rate of breast cancer late-stage diagnosis, among the women with lower socioeconomic status, is more than the others. The aim of this study was investigation the relationship between family levels of socioeconomic status and stage at diagnosis of breast cancer.

Methods: This cross-sectional, descriptive study has conducted on 526 patients who have suffered from breast cancer, and have registered in Cancer Research Center of Shahid Beheshti university of Medical science, from March 2008 till December 2013. A reliable and valid questionnaire about family status of socioeconomic status, have filled by interviewing the patients via phone. For analyzing the data, Multinomial logistic regression, Kendal tau-b correlation coefficient and Contingency Coefficient tests have executed by SPSS 19.

Results: The results have indicated that the mean age of the patients was 48.30 (SD=11.41). There was a significant relationship between stage at diagnosis of breast cancer and family levels of socioeconomic status at the time of diagnosis (p=0.024). Also, the relationship between stage at diagnosis and living place (in or out of Tehran) was significant (p=0.044). In the Multiple logistic regressions, these associations were significant. There wasn't any significant relationship between stage of diagnosis of breast cancer and age, marital status and family history.

Conclusion: Regarding the results of this study, deep paying attention to the family socioeconomic status as an important variable in stage at diagnosis of breast cancer, among Iranian women, was too important, and then providing the prevention plans related to this topic has seemed necessary.

Keywords: Socioeconomic Levels; Stage at diagnose; Breast cancer

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1. Dept. of Health and Community Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Cancer Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3. Dept. of Biostatistics, School of Paramedical, Shahid Beheshti University of Medical Science, Tehran, Iran

Corresponding Author:
Parvin Yavari, PhD;
Professor of Epidemiology
Tel: (+98) 2122439936
Email: P.yavari-grc@sbmu.ac.ir
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Introduction

Socio Economic Status or SES has been considered as one of the most important health risk factors nowadays. Indeed, it would be not only a considerable predictor of people's morbidity and mortality, but also really important in health policies, preventing, and intervening practices in public health researches [1-5]. Although the rate of breast cancer among wealthy women would be more than the others, at the same time several studies have shown that women with breast cancer form lower socioeconomic group have lower survival time.

It might be related to breast cancer detection delay, and differences in surveillance and treatment in poor women [6]. All over the Middle East including Iran, breast cancer is the most common malignancy among women [7]. According to the Iranian annual cancer registration report in 2009, there were 7582 breast cancers among Iranian women with the peak of 50 to 55 years [8].

Approximately, 71% of Iranian women at the time of reference or diagnosis of breast cancer have been in the advanced level of disease, and during the mentioned diagnosis, they have died. In spite of this fact that early diagnosis of breast cancer had an important role on reducing mortality and morbidity caused by breast cancer [9-11]. That could be the reason that the data of determinants of cancer stage in diagnosis would be a considerable issue for outcome improving. Recognizing the delay factors which have influenced delay in diagnosis and treatment, would be really important for policymakers to develop strategies to shorten delays [7].

Stage of cancer diagnosis has related to socioeconomic status, age, marital status, existence and type of health insurance and race-ethnicity [12-14]. This study has conducted to determine the relationship between stage at diagnosis of breast cancer and family levels of socioeconomic status and identifying some effective factors on the stage of diagnosis.

Materials and Methods

This cross-sectional, descriptive study has conducted on 526 patients who have suffered from breast cancer and registered in Cancer Research Center of Shahid Beheshti University of Medical Sciences from March 2008 to December 2013. The minimum size of samples with regard to p=50%, α=5% and d=5% was 384. The data about family socioeconomic status has gathered by interviewing the patients via phone and completing a questionnaire related to socioeconomic status. The questionnaire was the result of a study named "Socio-Economic Status in Iran: A study of measurement index"[15] for measuring family levels of socioeconomic status and its relationship with various health outcomes that its reliability and validity has measured. The determiner variables for family socioeconomic status in this questionnaire were the education of head of household, patient's education, residential property, housing area per capita, welfare convenience such as owning personal car and computer that have scored according to the people answers.

The maximum score for the questionnaire was 48, considering the median, the first and the third quartile, family socioeconomic status categorized to 4 levels: poor, average, good and excellent. The stage of breast cancer diagnosis has categorized from 1 to 4 according to the pathological report of disease progression.

Multinomial logistic regression, Kendal tau-b, contingency coefficient have used for analyzing the data. Statistical analyses have performed by SPSS19 software. Patients' names were secret and their satisfactions for cooperating have gathered before commencing the study.

Results

Generally, 970 patients with breast cancer have registered in Cancer Research Center of Shahid Beheshti University of Medical Sciences from March 2008 to December 2013. Of these, 14 patients who were men and 15 patients who weren't Iranian have excluded according to the inclusion criteria of the study. Among the others, 526 patients have assisted the researchers and answered the questions about family levels of socioeconomic status. The mean age of patients was 48.30 (±11.41). The lowest age was 21 and the highest one was 90 and the median age was 48. Of the patients, 480 (91.3%) have married, 30 (5.7 %) were single and 16 (2.1%) were widow or got divorced. Most of the patients (63.7%) have lived in Tehran and the others have lived in the other cities. One hundred sixty five patients (31.7%) had breast cancer in their close relatives. By considering the median and the first and third quartiles, the family socioeconomic status has categorized into 4 categories (poor: ≤17, moderate: 18 to 21, good: 22 to 27 and excellent: ≥28). The characteristics of patients have shown in table 1.

There was a significant relationship between the stage at diagnosis of breast cancer, and family socioeconomic status (p=0.024). Also, the relationship between stage at diagnosis of breast cancer and living in Tehran was significant (p=0.044) (Table 2).

Regarding the table 3, in the Multiple Multinomial logistic regression, the relationship between stage at diagnosis of breast cancer and family levels of socioeconomic status was significant. Also, there was a significant relationship between stage at diagnosis of breast cancer and living place.

In the model of Multiple Multinomial logistic regression, these results have excluded (Table 3): The odds of stage 3 and 4 of breast cancer was 89 % higher in women with weak and moderate socioeconomic status in comparison with excellent

socioeconomic status, 40% lower in women who have lived in Tehran, in comparison with the others. The odds of stage 2 of breast cancer were 87% higher in patients with good socioeconomic status and 97% higher in patients with weak socioeconomic status in comparison with women with excellent socioeconomic status. There wasn't any significant relationship between stage at diagnosis of breast cancer and marital status, age at diagnosis and family history of breast cancer.

Discussion

According to the results of this study the mean age of patients was 48.3 (SD=11.4) and 3.8% of patients were lower than the age of 30. In the study of Yavari et al., the mean age of patients was 48.8 (SD=9.8) that was comparable to this research [16]. Also in the research of Movahedi et al the mean age of patients was 49.8 (SD=12.3) [17] and in study of Ebrahimi et al., the mean age of patients was 46.2 and 7% of patients were lower than 30 years [18].

Table 1. The characteristics of breast cancer patients (n=526).

Variable	Classification	Frequency	Percent
Age groups (years)	< 30	20	3.8
	30–40	101	19.2
	41–50	209	39.7
	51–60	124	23.6
	> 60	72	13.7
	Mean (SD)	48.30 (11.41)	-
	Range	21–90	-
Marital status	Single	30	5.7
	Married	480	91.3
	Widowed/divorced	16	2.1
Education levels	Illiterate/Primary	82	15.6
	secondary / High school	271	51.5
	Academic	173	32.9
Family history	yes	167	31.7
	no	359	68.3
SES	Weak	129	24.5
	Moderate	107	20.3
	Good	142	27.2
	Excellent	147	28
Place of residence	Tehran	335	63.7
	others	191	36.3
Stage of disease	I	185	35.2
	II	199	37.8
	III	123	23.4
	IV	19	3.6

Table 2. Relationship between stage at diagnosis of breast cancer and age, marital status, family history of breast cancer, family levels of socioeconomic status and living place (univariate analysis).

Variable	Classification	Stage of diagnosis			Test statistic	p-value
		I	II	III/IV		
Age at diagnosis	<40	40 (33.1)	42 (34.7)	39 (32.2)	-0.68[1]	0.495
	41-50	77 (36.8)	81 (38.8)	51(24.4)		
	51-60	41 (33.1)	48 (38.7)	35 (28.2)		
	>60	27 (37.5)	28 (38.9)	17 (23.6)		
Marital Status	Single	11 (36.7)	2 (40.0)	7 (23.3)	0.062[2]	0.725
	Married	167 (34.8)	180 (37.5)	133 (27.7)		
	Divorced/ widow	7 (43.8)	7 (43.8)	2 (12.5)		
Family history	Yes	58 (34.7)	70 (41.9)	39 (23.4)	0.07[2]	0.317
	No	127 (35.4)	129 (35.9)	103 (28.7)		
SES	Weak	38 (29.5)	55 (42.6)	36 (27.9)	-2.26[1]	0.024*
	Moderate	37 (34.6)	36 (33.6)	34 (31.8)		
	Good	44 (30.8)	60 (42.0)	39 (27.3)		
	Excellent	66 (44.9)	48 (32.7)	33 (22.4)		
living place	Tehran	129 (38.5)	126 (37.6)	80 (23.9)	0.108[2]	0.044*
	Others	56 (29.3)	73 (38.2)	62 (32.5)		

1: Kendall's tau; 2: Contingency Coefficient Significant variables are indicated with *.

According to the results of this study, there was a significant relationship between stage at diagnosis of breast cancer and family socioeconomic status (p=0.024). It has meant that people with poor socioeconomic status have been diagnosed at more advanced level of disease. This association in multiple multinomial logistic regressions, after adjusting the effects of age, marital status, and family history of breast cancer and place of residence, was significant. Harirchi et al. has found that low income was one of the causes of delay for referring the women with advanced breast cancer [19]. Richardson et al. have found that low socioeconomic status was one of the risk factors of late stage diagnosis of breast cancer and patients' referring [14]. Also, Sharma et al. has stated that lower education level and less income status were main factors in delay in breast cancer diagnosis in developing countries [20].

In this study, the relationship between the stage at diagnosis and living place (living in Tehran) was significant (p=0.044). This relationship in multiple multinomial logistic regression between stage at diagnosis 3 and 4 and living place was significant (Cl: 0.37- 0.96, OR=0.60). It means that the odds of stage 3 and 4 of breast cancer diagnosis among those women living in Tehran were 40 percent lower than those patients who didn't live in Tehran. Harirchi et al. has found that living in small cities and lack of health facilities has contributed for delaying in referring the patients with advanced level of breast cancer [18]. According to the results of Mac Kinon et al. study, living place had an important role for defining risk of advanced breast cancer [20, 21].

In our study, there was no significant relationship between stage at diagnosis of breast cancer and marital status, age at diagnosis and family history. Although, Harirchi et al. has found that delay in referring to physician has associated with marriage and negative family history of breast cancer [18]. Richardson et al. has indicated that one of the causes of late stage diagnosis of breast cancer and delay in patient's referring to physician has been younger ages [14].

Conclusion

Socioeconomic Status is an important variable in breast cancer stage at diagnosis and preventing plots related to this topic is necessary. Also, increasing the women knowledge about this disorder in order to sooner diagnosis is notable.

There were some limitations in this study. The possibility of recall bias was an issue as some women might have wrongly estimated socioeconomic status before diagnose of breast cancer. Additionally, this research has conducted in a university (teaching) hospital, so the results might not be extended to all Iranian women.

Further qualitative and quantitative research have recommended to understand the barriers that lead women to delay breast symptoms care, as well as the barriers within health-care systems that has contributed to failure for diagnosing breast cancer earlier , and delay timely treatment. It has seemed

Table 3. Relationship between stage at diagnosis of breast cancer and age, marital status, family history of breast cancer, family levels of socioeconomic status and living place (Multiple Multinomial Logistic Regression Analysis).

Variable	Stage II vs. stage I			Stage III/IV vs. stage I		
	Odds ratio	95% confidence interval	p-value	Odds ratio	95% confidence interval	p-value
Age at diagnosis						
< 40	0.96	0.46,1.99	0.912	1.61	0.73, 3.57	0.240
41-50	1.00	0.53,1.88	0.994	1.09	0.53, 2.25	0.820
51-60	1.08	0.54,2.15	0.827	1.37	0.63, 2.97	0.425
> 60	1.00	Referent		1.00	Referent	
Marital Status						
Single	1.15	0.48,2.77	0.752	0.74	0.27, 2.04	0.556
Married	1.00	Referent		1.00	Referent	
Family history						
Yes	1.26	0.81,1.96	0.294	0.84	0.51, 1.39	0.501
No	1.00	Referent		1.00	Referent	
SES						
Weak	1.97	1.12,3.48	0.018*	1.89	1.01, 3.56	0.048*
Moderate	1.34	0.74,2.43	0.340	1.89	1.01, 3.58	0.050*
Good	1.87	1.09, 3.22	0.023*	1.69	0.92, 3.10	0.092
Excellent	1.00	Referent		1.00	Referent	
living place						
Tehran	0.75	0.49, 1.17	0.208	0.60	0.37, 0.96	0.032*
Others	1.00	Referent		1.00	Referent	

Stage I is regarded as the base. Significant variables are indicated with *.

that Lack of information related to socioeconomic status, in surveillance system of cancer registry, has limited assessment of the role of this subject. Therefore, socioeconomic status should be focused to promote knowledge in relation to breast cancer stage at diagnosis in the general population.

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Conflict of Interest

The authors have no conflict of interest in this article.

Authors' Contribution

Pegah Mohaghegh has collected the data and revised and edited the manuscript. Farzane Ahmadi and Pegah Mohaghegh have analyzed it.

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