Breast cancer risk factors among Sundanese and other ethnic groups in Indonesia

Setyawati Budiningsih*, Yoshiyuki Ohnot, Joedo Prihartono*, Drupadi S Dillon#, Gunawan Tjahjadi§, Esti Soetrisno§, Endang Hardjolukito§, Muchlis Ramli•, ldral Darwis•, Didid Tjindarbumi•, Goi Sakamoto'll, Kenji Wakait, Santoso Cornain§

Abstrak

Penelitian cara kasus-kontrol telah dilakukan untuk analisafaktor risiko pada kanker payudara wanita Indonesia. Tiga ratus kasus dan 600 kontrol diwawancara menggunakan kuesioner baku untuk pengumpulan data epidemiologik. Subyek diteliti untuk berbagai data demografik, status reproduksi, perilaku seks, kebiasaan makan dan cara-cara hidup lain. Data dianalisa untuk menentukan faktor risiko yang bermakna menggunakan analisa univariat dan multivariat. Perhatian khusus diberikan untuk evaluasi faktor risiko berkaitan dengan golongan etnik yang berbeda. Suku Sunda, yang dikenal berbeda dengan suku-suku lain dalam hal kebiasaan makan dan cara hidup yang lebih tradisional, dibandingkan dangan suku-sulw non-Sunda. Hasilnya menampakkan bahwa faktor-faktor risiko berikut: ting kat sosial ekonomi dan pendidikan, tempat tinggal (pedesaan versus perkotaan), status perkawinan dan pekerjaan tidak bermakna, sedangkan di antara suku non-Sunda, menstruasi yang tidak teratur dan trauma payudara meningkatkan risiko, dengan OR dan C/95% masing-masing = 1,60; 1,12-2,28 dan 1,89; 1,02-3,48. Pengaruh semacam itu ditunjukkan juga oleh populasi seluruhnya. Peningkatan risiko karena kebiasaan makan ditunjukkan oleh konsumsi makanan yang mengandung santan dan daging berlemak, baik pada suku Sunda maupun non-Sunda dan pada populasi seluruhnya. Rasia Odd (OD) pada suku Sunda lebih tinggi daripada OD pada kelompok lain, yaitu 1,95 versus 1,31 dan 1,43 untuk makanan yang mengandung santan dan 1,93 versus 1,37 dan 1,47 untuk daging berlemak. Penurunan risiko ditunjukkan oleh konsumsi sari sayuran/buah pada suku Sunda dan populasi seluruhnya dengan OD yang lebih rendah pada suku Sunda, yaitu 0,31 versus 0,61. Pengaruh protektif tersebut ditunjukkan juga oleh konsumsi sayuran segar; telur dan daging tidak berlemak pada suku Sunda dan populasi seluruhnya, dengan nilai OD yang mirip. Dengan analisa multivariat, pengaruh konsumsi telur dikonfirmasi baik pada suku Sunda maupun non-Sunda, sedangkan pengaruh sari sayuran!buah hanya terlihat pada suku Sunda dan pengaruh susu hanya terlihat pada suku non-Sunda.

Abstract

A case control study has been performed for analyzing risk factors of breast cancer in Indonesia females. Three hundred cases and 600 controls were interviewed using standard questionnaires for epidemiological data collection. The subjects were probed for various demographic data, reproductive status, sexual behaviors, dietary habits and other lifestyles. The data were analyzed for determining significant risk factors using both univariate and multivariate analysis. Special attention has been pay on evaluating the risk factors in relation to different ethnic groups. Sundanese ethnic group known to differ in their dietary habits and certain lifestyles to the other ethnic groups, was compared to non-Sundanese. The results showed that among Sundanese, the following risk factors: socio-economic and education levels, living area (rural versus urban), marital status and working status were not significant, while among non-Sundanese, the irregular menstruation and breast trauma increased the risk, with OR and 95%Cl of 1.60; 1.12-2.28 and 1.89; 1.02-3.48 respectively. Such an effect was shown also by the whole population. Increased risk due to dietary habits was shown by intakes of coconut milk containing food and fatty meat in both Sundanese and non-Sundanese groups and in the whole population. The Odds ratios (OD) in the Sundanese were higher than the OD in the others, i.e. 1.95 versus 1.31 and 1.43 for coconut milk containing food and 1.93 versus 1.37 dan 1.47 for fatty meat. Decreased risk was shown by vegetable(fruit intake in the Sundanese and the whole population, with lower Odds Ratio in the farmer; i.e. 0.31 versus 0.61. Such protective effect was also shown by intakes of fresh vegetable, egg and non-fatty meat in the non-Sundanese group and in the whole population, with similar figures of Odds Ratios. By multivariate analysis, the effect of egg consumption was confirmed in both Sundanese and non-Sundanese, while the effect of vegetable(fruit juice was only seen in Sundanese and the effect of milk was only seen in non-Sundanese.

Keywods: *Breast cancer; case control study, ethnic analysis, risk factors.*

* *Department of Community Medicine, Faculty of Medicine, University of lndonesia, Jakarta 10320, Indonesia*
t *Department of Preventive Medicine, School of Medicine, Nagoya University, Nagoya 466, Japan*
Department of Nutrition, Faculty of Medicine, University of Indonesia, Jakarta 10430, Indonesia
§ *Deparotment of Pathology, Faculty of Medicine, University of Indonesia, Jakarta 10430, Indonesia*
• *Department of Surgery, Faculty of Medicine, University of Indonesia, Jakarta 10430, Indonesia*
'll *Department of Pathology, Cancer institute Hospital, Tokyo 170, Japan*

INTRODUCTION

Breast cancer remains as an important cancer problem both in the developed and in the developing countries. L-3 In Indonesia, breast cancer ranked the second among females, with slight increase of its specific incidence rate observed within 5 years from 1988 up to 1992.4,5 Descriptive epidemiological studies of breast cancer (BC) shows that there were variations in incidence and mortality rates. These features cannot solely be explained by genetic factor, but are also dependent on other factors such as dietary pattern, endocrin function, sexual behavior, external exposure and other life style behaviors.2,3

This study analysis is based on the assumption that each race/ethnic group differ in physical, socio-cultural and dietary pattern , which could be a risk factor for the development of breast cancer. Many studies revealed that dietary pattern, especially the high intake of fat is a risk factor for BC .2,3,6,7 For Indonesia, which consists of about 300 ethnic groups, it is important to study the differences of BC risk among those groups. Among the Indonesian ethnicity, Sundanese is famous for their dietary pattern, which consists of high fiber. They consume a lot of raw vegetables and seldom to use coconut milk/fat in their food dishes .8,9 Looking at the Sundanese population, it is the second most populous ethnic group in Indonesia. Beside the different dietary pattern, the Sundanese also has a more active reproductive behaviour. Using the data of the latest case-control study on BC in Jakarta, this paper will explore the risk factor of BC among the Sundanese and other ethnic groups (Non-Sundanese).

MATERIALS AND METHODS

A joint study between Japan and Indonesia on breast cancer has been caried out in three fold-study, namely epidemiological, clinical and histopathological aspects analysis. The design of the study has been described in a previous report.10.11 This study was performed on 300 cases and 600 controls, which were collected from Dr. Cipto Mangunkusumo Hospital, Jakarta, from 1989 - 1992. The cases had to be histopathologically confirmed before inclusion in the study, except for the cases at stage IIIA. The matching variables between case and control were age at the time of interview (± 3 years), date of interview (± 3 months) and socio-economic level. Socio-economy level was perceived as the level of the hospital-class which the patient planned for hospitalization. Controls were selected among outpatient and inpatient at the department of surgery. The epidemiological data were collected by interview using standard questionnaires. Trained interviewers collected information on demographic, reproductive, contraceptive history, dietary pattern and some life style behaviour. Information on diet consist of qualitative data concerning frequaency in consuming certain foods. Statistical analysis were carried out using SPSS package . Odds ratios from univariate and multivariate analysis were compare to found the different risk between the Sundanese and other ethnic group.

RESULTS

In this study, Sundanese represents 21.1% of the subject respondents, consisting of 24.1% cases and 75.9% controls, whi le the other ethnic groups consisted of 32.4% cases and 67.6% controls (see Table 1). Thus, the case to control ratio for this ethnicity satisfy the ration of the main case control study, i.e. l:2. Table 2 shows the comparison on several demographic and reproductive variables between the Sundanese and other ethnic groups. The age and the nutritional status which represented by height and weight were similar in both groups. The Sundanese had significant lower age of marriage and higher number of live birth and number of children lactated (18.5 vs 20.3, 3.8 vs 3.2 and 3.7 vs 3.1). Table 3 showed that socio-economic level for the other ethnic groups and the whole population population was a risk factor for having BC 0R=2.26; 95%CI: 1.37 - 3.73 and OR = 1.60; 95%CI: 1.03 - 2.49, but not for the Sundanese. The longest stay in urban area seemed

Table 1. Comparison between Sundanese and other (Non-Sundanese) ethnic groups in distribution of cases and controls

Group	Sundanese		Other ethnic groups		Total	
	N	%	N	%		%
Case	70	24.1	230	32.4	300	33.3
Control	121	75.9	479	67.6	600	66.6
Total	191	100.0	709	IOO.O	900	100.0

Table 2. Comparison between Sundanese and other ethnic groups on several variables

Variables	Sundanese			Other ethnic			t-test
	X	±	SD	X	±	SD	
Age	48.2	±	11.4	46.6	±	12.1	0.10
Weight	51.3	±	17.3	50.7	±	11.8	0.55
Height	152.4	±	13.0	152.9	±	22.0	0.75
Age at menarche	14.2	±	1.6	14.2	±	1.4	0.80
Age at 1st sex	18.4	±	3.7	20.3	±	4.1	0.00*
Age at marriage	18.5	±	3.8	20.3	±	4.1	0.00*
Number of live birth	3.8	±	2.7	3.2	±	2.4	0.00*
Still birth	0.3	±	0.8	0.2	±	0.6	0.26
Abortion	0.3	±	0.6	0.4	±	0.7	0.08
No of children lactated	3.7	±	2.7	3.1	±	2.5	0.00*

* *significant*

Table 3. Risk factors estimates comparing Sundanese to other ethnic groups for demographic characteristic

	Sundanese		Other ethnic groups		Race adjusted	
	OR	95%CI	OR	95%CI	OR	95%CI
Socio-economic level (VIP,)S!, 2nd vs 3rd class)	0.3	(0.14 - 1.31)	2.26	(1.37 - 3.73)*	1.60	(1.03 - 2.49)*
Education (Sen HS, Acad vs Illiterate, Prim, Jun HS)	1.26	(0.56 - 5.85)	1.25	(0.88 - 1.75)		
Longest stay (Rural vs Urban)	0.72	(0.38 - 1.3)	0.39	(0.27 - 0.55)*	0.46	(0.34 - 0.62)*
Marital status (Married vs unmarried)	0.42	(0.05 - 3.63)	1.30	(0.75 - 2.27)	1.20	(0.70 - 2.04)
Working status (No vs Yes)	0.33	(0.13 - 0.81)*	0.78	(0.53 - 1.13)	0.68	(0.48 - 0.95)*

* *significant*

to be a reducing factor for the Sundanese as well as the other ethnic groups and population as a whole, but only significant for the other ethnic groups and the whole population (OR = 0.39; 95%CI: 0.27 - 0.55 and OR = 0.46; 95%CI: 0.34 - 0.62). Working status showed as a reducing factor in both groups, but only significant for the Sundanese and the whole population (OR= 0.33, 95%CI: 0.13 - 0.81 and OR = 0.68; 95%CI: 0.48 - 0.95) (see Table 3).

Table 4 shows comparison of relative risk on menstrual regularity, hormonal contraceptive use and breast trauma between the Sundanese and other ethnic groups. None of these variables were significant as a risk factors for the development of BC among Sundanese. While for. other ethnic groups and the population, menstrual irregularity and breast trauma were found to increase the risk for the development of BC (OR = 1.60; 95%CI: 1.12 - 2.28 & OR = 1.55; 95%CI: 1.12 - 2.13 and OR = 1.89; 95%CI: 1.02 - 3.48 & OR = 1.94 ; 95%CI: 1.13 - 3.36).

Table 5 shows the dietary pattern of drinks, vegetables and fat food consumed. For the Sundanese, although juice and fresh vegetables were found to reduce the risk, but it was only significant for juice (OR = 0.31; 95%CI: 0.11 - 0.86). Fresh vegetables were significantly reduced the risk factor for the other ethnic groups (OR = 0.60; 95%CI: 0.41 - 0.89) and the whole population (OR = 0.64; 95%cl : 0.45 - 0.91). The intake of fatty meat, coconut food, egg and milk in general were found as the increasing risk factors. But in this study only fatty meat and coconut food (food cooked with coconut milk) were found to increase the risk for the development of BC among Sundanese, other ethnic groups and the whole population . However, these risks were a little higher for the Sundanese (OR = 1.93 and 1.95, respectively) as compared to other ethnic groups (OR = 1.37 and 1.31 respectively).

Table 4. Risk factors estimates by comparing Sundanese to other ethnic groups for menstrual regularity, contraceptive use and breast trauma

Variable	Sundanese		Other ethnic groups		Race adjusted	
	OR	95%CI	OR	95%CI	OR	95%Cl
Menstrual (regular vs irregular)						
< 20 years	2.42	(0.88 - 0.64)	0.94	(0.58 - 1.52)	1.14	(0.74 - 1.76)
20-40 years	1.05	(0.45 - 2.42)	0.83	(0.54 - 1.26)	0.87	(0.60 - 1.27)
> 40 years	1.38	(0.69 - 2.76)	1.60	(1.12 - 2.28)*	1.55	(l.12 - 2.13)*
Hormonal contraception (Yes vs No)	1.72	(0.74 - 3.98)	1.44	(0.85 - 2.4)		
Breast trauma (Yes vs No)	2.18	(0.65 - 7.22)	1.89	(1.02 - 3.48)*	1.94	(1.13 - 3.36)*

* *significant*

Table 5. Risk factors estimates by comparing Sundanese to Non-Sundanese ethnic groups for dietary pattern

Variable	Sundanese		Other Ethnic		Race adjusted	
	OR	95%CI	OR	95%CI	OR	95%CI
Juice	0.31	(0.11 - 0.86)*	0.73	(0.42 - 1.26)	0.61	(0.38 - 0.98)*
Green vegetable	1.58	(0.69 - 3.63)	0.91	(0.66 - 1.25)	0.98	(0.73 - 1.31)
Fresh vegetable	0.79	(0.39 - 1.63)	0.60	(0.41 - 0.89)*	0.64	(0.45 - 0.91)*
Egg	0.50	(0.25 - 1.02)	0.49	(0.34 - 0.71)*	0.49	(0.35 - 0.69)*
Non fatty meat	0.90	(0.49 - 1.65)	0.72	(0.52 - 0.98)*	0.75	(0.57 - 1.0)
Coconut drink	1.32	(0.44 - 3.97)	1.26	(0.73 - 2.19)	1.28	(0.78 - 2.09)
Coconut food	1.95	(1.06 - 3.59)*	1.31	(0.95 - 1.81)*	1.43	(1.08 - 1.90)*
Fatty meat	1.93	(1.01 - 3.69)*	1.37	(0.99 - 1.90)*	1.47	(1.10 - 1.96)*
Milk	1.71	(0.93 - 3.11)	2.11	(1.53 - 2.89)*	2.01	(1.52 - 2.66)*
Canned food	2.66	(0.46 - 15.32)	2.10	(0.54 - 8.23)	2.30	(0.78 - 6.75)

* *significant*

Table 6. Comparative Multivariate between Sundanese and Non-Sundanese ethnic groups

	Sunda		Non Sunda	
Variable	B	Sign	B	Sign
Class	-0.8910	0.1515	0.7521	0.0069*
Stay	-0.4689	0.1751	-1.0951	0.0000*
Milk	0.4867	0.1780	0.7477	0.0000*
Juice	-1.2838	0.0383*	-0.1833	0.5432
Meat	0.3435	0.3789	-0.0946	0.6116
Fat meat	0.6299	0.1065	0.2016	0.2841
Egg	-0.7863	0.0420*	-0.7506	0.0002*
Confood	0.6085	0.0823	0.1347	0.4550
Fresh	0.0942	0.8239	-0.3772	0.5853

* *significant*

Table 6 shows the multivariate analysis of 9 factors in each group (Sundanese and Non-Sundanese). There were 2 significant factors found in the Sundanese, namely juice (fruit/vegetable diet) and the egg (egg consumption); and 4 significant factors in the Non-Sundanese, namely the socio-economic level (class), longest place to live (stay), milk consumption and egg. For the Sundanese, juice was the strongest factor, but both were found to reduce the risk of breast cancer. For the Non-Sundanese, egg consumption and longest stay in urban area were the reducing factor. Milk consumption and lower socio-economic level showed to be the increasing risk of breast cancer. Only egg had the similar effect on both groups.

DISCUSSION

This study is the first attempt to look for BC risk factors based on ethinicity in Indonesia. The comparison of the risk factors between Sundanese and other ethnic groups in this study will show better information if the number analyzed of the Sundanese and other ethnic groups is more or less the same number of population studied.

Many studies showed that reproductive aspects such as age of marriage, number of live birth and children lactated were the related factors for BC. In this study it was shown that the Sundanese had a significant lower age of marriage, number of children and lactated ones. The features were similar to the result of the demographic characteristics in the Sensus find-

ings. Those factors were regarded as a protective factors for BC.

Regarding the diet pattern, it has been generally assumed that the Sundanese consumed more fresh vegetable/fruit or non fatty meat than the Non-Sundanese. In the Sundanese, only consumption of fruit/vegetable showed reduced risk of breast cancer. The consumption of coconut milk containing food and fatty meat had a similar effect on both groups, which gave a notion that this two kinds of food had been consumed in the same dietary pattern. On the other hand, the study showed that the Non-Sundanese diet on fresh vegetable and non fatty meat were found to be protective factors. The similar pattern in the Sundanese and Non-Sundanese in this study might be caused by the changing pattern of diet among the Sundanese due to prolonged stay in the urban area. In order to avoid this bias, we initiated a field nutritional study comparing the risk factors in two ethnically unrelated populations living in their original geographical area.

The significant protective effect of vegetable/fruit juice intakes among the Sundanese was revealed by the multivariate analysis. The egg intake appeared to be a significant protective factor as well. Among the Sundanese, intakes of egg and milk reduced the risk of breast cancer.

CONCLUSION

This study aimed to find the difference in diet pattern between the Sundanese and Non Sundanese, which could be related to the development of breast cancer. The result showed that for the Sundanese, consuming fruit/vegetable was the only protective factor, while consuming coconut milk containing food and fatty meat were found to increase the risk. Result of multivariate analysis, showed that fruit/vegetables cqnsumption still prevent the development of breast cancer.

In the Non Sundanese, socio-economic level and milk consumption were risk factors while egg consumption and living longest time in the urban area decreased the risk of breast cancer. The egg intakes had a preventive effect on both Sundanese and Non-Sundanese. Overall there was no difference in the diet pattern between the Sundanese and the Non-Sundanese.

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