

Acceptance of Prophylactic Surgery and Chemoprevention of Cancer in Singapore – A Survey

HT See,¹*MRCP (UK), FAMS (Med Oncol)*, YB Cheung,²*PhD*, F Yong,³*SRN, ONC, BHSC*, KS Khoo,⁴*MRCP (UK), FAMS (Med Oncol)*, P Ang,¹*MRCP (UK), M Med (Int Med)*

Abstract

Introduction: In addition to surveillance practices, chemoprevention and prophylactic surgery can reduce the risk of cancer in individuals at high risk. Sociocultural factors may have a role to play in such decision making. Little is known regarding the factors that play a role in decision making in Singapore. **Materials and Methods:** One hundred and two individuals at normal risk completed a questionnaire on the concept of chemoprevention and prophylactic surgery. The results were analysed using the convenience sampling method. **Results:** Participants were mostly Chinese (94.1%). More than 90% of the respondents answered the section on prophylactic surgery and chemoprevention. Thirty-eight individuals (41.3%) would not consider prophylactic surgery, while 42 (45.7%) would not consider prophylactic surgery now but might consider it in the future. Twenty-five individuals (26.9%) would not consider chemoprevention by taking a medication, 57% would not consider it now but might in the future. **Conclusion:** A cross-sectional public view suggests that medical prophylaxis is likely to be more acceptable to the general public compared to surgical prophylaxis.

Ann Acad Med Singapore 2005;34:238-42

Key words: Cancer prevention, Chemoprevention, Prophylactic surgery, Singapore

Introduction

The Singapore healthcare philosophy aims to establish a healthy population through preventive healthcare programmes and public health education. Public education usually emphasises the adverse consequences of harmful habits like smoking, alcohol consumption, poor dietary habits and sedentary lifestyles that may contribute to chronic and fatal diseases such as ischaemic heart disease and cancer. However, cancer remains the number one cause of death in Singapore,¹ the 3 most common cancers being lung, breast and colorectal cancer. The majority of cancers are considered sporadic, while only 5% to 10% are considered hereditary.² In addition to surveillance practices, chemoprevention and prophylactic surgery are potential ways of reducing the risk of cancer in individuals at an elevated risk of cancer.³ Bilateral mastectomy for individuals with BRCA 1 and BRCA 2 mutations, for example, has

helped to prevent breast cancer.⁴ Chemoprevention is an emerging concept, with most evidence of its efficacy found in the case of breast cancer.^{5,6} The attitudes of Singaporeans towards chemoprevention and prophylactic surgery have not been studied. Sociocultural factors and perceived risks play a role in such decision making.⁷ We performed a preliminary survey to ascertain the attitudes of individuals towards chemoprevention and prophylactic surgery in a setting of people attending public education talks.

Materials and Methods

One hundred questionnaires were given out to individuals in Singapore from November 2002 to December 2002 during public health talks. In addition, we also gave out questionnaires to 20 individuals who attended high-risk clinics at the KK Hospital and National Cancer Centre, Singapore from November 2002 to January 2003. These

¹ Department of Medical Oncology
National Cancer Centre, Singapore

² Division of Clinical Trials & Epidemiological Sciences
National Cancer Centre, Singapore

³ Public Cancer Education
National Cancer Centre, Singapore

⁴ Gleneagles Medical Centre, Singapore

Address for Reprints: Dr HT See, Department of Medical Oncology, National Cancer Centre, 11 Hospital Drive, Singapore 169610.

Email: dmosht@nccs.com.sg

were individuals with either a personal high risk of familial cancer or a family history predisposing them to a higher risk of cancer. Questionnaires were in English and Mandarin. Apart from demographic data, questions were asked to identify the perceived personal risk of cancer compared to normal, and the concerns of getting cancer. “Normal risk” was explained in the questionnaire as what the individual felt to be the risk of the general population in Singapore. The concept of prophylactic surgery and chemoprevention was explained briefly in the questions. Individuals self-administered the questionnaires on a voluntary basis although healthcare professionals were available to clarify questions. At the time of administration, the healthcare professionals did not formally evaluate individuals for their personal risk of cancer. The individuals had to answer at least 70% of the questions to be eligible. The data were analysed using SPSS statistical analysis software for Windows version 10.0 (Chicago, Illinois). Multivariate analysis was carried out to determine if any demographic data would influence the respondents’ response to questions regarding prophylactic surgery and chemoprevention.

Results

Demographic Data

Demographic data of individuals are shown in Table 1. A total of 102 questionnaires were analysed. The majority (98.0%) had qualifications equivalent to ‘O’ levels, or higher. More than half were married (56.9%), and had children (53.9%). A greater proportion was also English-speaking (54.9%), although a high percentage (30.4%) were bilingual. The majority of the respondents were aware of having a member of the family with cancer (76.5%) while only 7 (6.9%) had a personal history of cancer.

Perceived Risk of Cancer

Sixty-two individuals (60.8%) were at least moderately concerned about their personal risk of developing cancer, of which 20 (32.0%) were extremely worried. Of the individuals who had a family history of cancer, 43 individuals (42.2%) considered themselves to have a risk higher than that of the general population, and among these 43 individuals, 15.7% considered themselves to have a risk much higher than that of the general population. More than half (53%) the individuals considered themselves to have a lower or the same risk as the rest of Singapore. All of the individuals were interested to know the figures for their personal risk of cancer. Within this group of individuals, concern towards one’s risk of cancer seemed to correlate with one’s educational level. Twenty-three of 49 individuals (46.9%) [95% confidence interval (CI), 32.5 to 61.7] with ‘O’ level education or less were either not concerned or a little concerned about their risk of cancer. This compared to 15 of 53 individuals (28.3%) (95% CI, 16.8 to 42.3) with

Table 1. Demographic Data

Age (y)	n = 102 (%)
Median	47
Range	16-77
<50	63 (61.8)
>50	39 (38.2)
Sex	
Female	69 (67.6)
Male	33 (32.4)
Race	
Chinese	96 (94.1)
Malay	1 (1.0)
Indian	3 (2.9)
Others	2 (2.0)
Married	
Single	40 (39.2)
Married	58 (56.9)
Divorced/separated/widowed	3 (2.9)
Did not answer	1 (1.0)
History of cancer	
Self	7 (6.9)
Parent	30 (29.4)
Sibling	17 (16.7)
Education	
‘O’ level and below	49 (48)
‘A’ level and above	52 (52)
Job	
Full-time	63 (61.8)
Part-time	9 (8.8)
Not employed/retired	29 (28.4)
No answer	1 (1.0)
Spoken language	
English and bilingual	87 (85.3)
Chinese only	15 (14.7)

‘A’ levels or above who were a little or not concerned about the risk of cancer ($P = 0.066$). In contrast, only 16% of the individuals who had ‘O’ level education or less and 15% of individuals who had ‘A’ level education considered themselves as being at a much higher risk of getting cancer compared to the general population. This difference was not statistically significant ($P = 0.864$).

The perceived risk was compared to the level of concern. A lower level of perceived risk was significantly associated with a lower level of concern ($P < 0.001$). A positive family history in the group of individuals that we studied was associated with a significant increase in the perceived risk ($P = 0.048$). However, there was no relationship between a positive family history and an individual’s attitude towards chemoprevention and prophylactic surgery, nor was there a positive influence on the perceived concerns of cancer in an individual and the attitude towards chemoprevention and prophylactic surgery (each $P > 0.05$). Age and gender did not influence the perceived risk of cancer.

Attitudes towards Prophylactic Surgery

In total, 90.2% of the respondents answered the section on prophylactic surgery. Of these 92 individuals, only 38 (41.3%) (95% CI, 31.1 to 52.3) would not consider prophylactic surgery, while 42 (45.7%) (95% CI, 46.3% to 67.2%) would consider prophylactic surgery. It is interesting that the other 13.0% regarded themselves as currently considering prophylactic surgery. However, it is not clear what surgery these individuals were referring to. It was also interesting that the individuals who answered the questionnaires did not seek confirmation of the term prophylactic surgery from the healthcare professionals who distributed the questionnaires.

We analysed the attitudes towards prophylactic surgery by the degree of the concern of getting cancer, and the perceived risk of getting cancer. Of the 100 respondents to the question of degree of concern of getting cancer, 9 (9%) did not respond to the question regarding prophylactic surgery.

Of the 38 respondents who were not worried or a little worried about getting cancer, 13 (34.2%) (95% CI, 19.6 to 51.4) would not consider prophylactic surgery while 21 (55.3%) (95% CI, 38.3 to 71.4) might consider it. Four individuals (10.5%) who were not worried or a little worried did not respond to this particular question. Of the 62 individuals who were moderately or extremely worried, 25 (40.3%) (95% CI, 38.6 to 64.5) would not consider prophylactic surgery, while 32 (51.6%) (95% CI, 28.1 to 53.6) might consider it. Five individuals (8.1%) did not respond to this particular question. The level of concern about getting cancer did not influence ($P > 0.05$) consideration of surgery.

Of the 16 individuals who perceived themselves at a much higher risk of getting cancer, 5 (31.3%) (95% CI, 11.0 to 58.7) would not consider prophylactic surgery while 10 (62.5%) (95% CI, 35.4 to 84.8) might consider surgery. One individual did not answer this particular question. Of the 81 individuals who considered themselves to be at a slightly higher risk or same risk of cancer, 33 (40.7%) (95% CI, 29.9 to 52.2) would not consider surgery while 41 (50.6%) (95% CI, 39.3 to 61.9) might consider surgery. Seven respondents did not answer this particular question. Perception of risk did not influence consideration of surgery ($P > 0.05$).

Similarly, comparing respondents who had the equivalent of 'O' level education to respondents with the equivalent of 'A' level showed no statistical differences (P value of 0.136). Neither age nor gender influenced decision making in our sample.

Attitudes towards Chemoprevention

91.2% of the respondents answered the section on

chemoprevention. Of these 93 individuals, only 25 (26.9%) (95% CI, 18.2 to 37.1) would not consider chemoprevention by taking a medication; 57% (95% CI, 35.2% to 56.4%) would consider and 16.3% regarded themselves as currently taking chemoprevention medications. However, our questionnaire did not require them to specify what chemoprevention medications these were.

When analysing the difference in the educational levels of the respondents and the willingness to consider chemoprevention against cancer, the results did not reach statistical significance. We also analysed the attitudes towards the chemoprevention of cancer by degree of concern of getting cancer, and the perceived risk of getting cancer. Of the 38 respondents who were not worried or a little worried about getting cancer, 14 (36.8%) (95% CI, 21.8 to 54.0) would not consider chemoprevention while 22 (57.9%) (95% CI, 40.8 to 73.7) would consider it. Two individuals (5.2%) did not respond to this particular question. Of the 62 individuals who were moderately or extremely worried, 11 (17.7%) (95% CI, 9.2 to 29.5) would not consider chemoprevention, while 45 (72.6%) (95% CI, 59.8 to 83.1) would consider it. Six individuals (9.7%) did not respond to this particular question. There was a trend towards a significant difference in the willingness to consider chemoprevention of cancer if an individual was moderately to extremely concerned about getting cancer ($P = 0.069$).

Of the 81 individuals who considered themselves at an only slightly higher risk or same risk or lower risk of getting cancer, 23 (28.4%) (95% CI, 18.9 to 39.5) would not consider taking chemoprevention medications. In this group of individuals, 53 (65.4%) (95% CI, 54.0 to 75.7) would consider taking chemoprevention medications in the future or regarded themselves as already taking them. Five individuals (6.2%) did not respond to this particular question. Of the 16 individuals who considered themselves at a much higher risk of getting cancer, 2 (12.5%) (95% CI, 1.6 to 38.3%) would not consider chemoprevention while 12 (75%) (95% CI, 47.6 to 92.7) would. Two did not answer this question. These results were not significant.

Only 2 individuals of 95 respondents would not consider doing anything if they found that they had 10 times the risk of cancer development compared to the rest of the general population. A majority (64.2%) of the individuals would either increase surveillance and screening practices or consider chemoprevention or prophylactic surgery after discussions with a doctor. 33.7% of the respondents would consider taking alternative medicine (or traditional Chinese medicine) with or without consulting a physician. Neither age nor gender influenced decision making in our sample.

Discussion

Cancer is a growing public health problem in Singapore. The proportion of death due to cancer increased from 20.9% in 1988-1992 to 25.6% in 1993-1997.⁸ A prospective study of breast cancer screening in Singapore concluded that mammography could be an important modality for detecting early-stage breast cancer in Singapore.⁹ However, the acceptance of free mammograms offered to women between the ages of 50 and 64 years was only 41.7%. Women who came forward for screening were more likely to be married, working, Chinese, from a higher socioeconomic group and have had more formal education. It has been suggested that health education has to focus on the issues related to acceptability if such screening is to succeed.⁹ Data from a study by Straughan¹⁰ based on the same population as the screening programme revealed the significance of fatalistic attitudes, perceived barriers and efficacy of early detection in predicting a women's acceptance of a free mammogram. Current efforts in Singapore with regard to screening have been to improve the education of the general public and to make screening modalities more available to individuals through their family physicians.

As with the role of screening in cancer prevention, greater information is available regarding other modalities of cancer prevention. Two possible methods in cancer prevention are chemoprevention and prophylactic surgery for higher-risk individuals. General guidelines on these issues have been published in the United States of America as well as in France after each of these countries set up a national task force to assess existing clinical evidence.^{11,12} Comparisons between these guidelines show the existence of differences, probably reflecting each country's cultural values.⁷ Subsequent studies have shown that prophylactic mastectomy and oophorectomy, as means of reducing the occurrence of breast and ovarian cancer, may be effective for individuals who are carriers of mutated BRCA1 and BRCA2 genes.^{13,14} In addition, the NSABP-P1 study has shown that for women at a higher risk, the use of tamoxifen is associated with reduction of the risk of invasive breast cancer by 49%.⁶ The acceptance of prophylactic surgery and/or chemoprevention in individuals at much higher risk has been studied. Recognition of personal risk is the first step, and the degree of worry and anxiety associated with the perceived risk leads many individuals to decide to undergo surgery or closer surveillance.^{15,16} Indeed, after prophylactic surgery, one of the parameters that change is a significant drop in the level of anxiety of individuals at very high risk.¹⁷ However, there are also international variations in the acceptance of surgery.⁷ Our survey is the first of such surveys in Singapore.

Recognition of risk is the first step. The extent to which

respondents in our study are able to recognise this personal risk is not clear and is not the aim of our survey. In our population, attention is currently placed on increasing the awareness of personal risk of cancer, and on inviting individuals to come forward for cancer screening. In keeping with the demographic finding in the previous studies where individuals who took up mammographic screening tended to be Chinese, we have also found a higher proportion of Chinese compared to the population profile coming for health talks although they were conducted in English. In the group of individuals we studied, we found a greater concern with risk of cancer to be associated with higher education. Perceived risk may be higher in the better educated, resulting in a positive influence in the uptake of the breast cancer screening in Singapore.⁴

Although familial cancer accounts only for 5% of all cancers and is therefore unlikely to account for the "cancer burden" in a population, the awareness that cancer may be hereditary may increase screening practices and relevant community education, and may indirectly reduce the cancer burden.

In our survey, if the risk were thought to be very high, most individuals would do something to avert the risk. However, 41.3% would not consider prophylactic surgery at all, while 26.9% would not consider chemoprevention. However, more than 50% of the individuals either had a personal history of cancer, or had a first-degree relative who had cancer. More than 50% of the respondents were at least moderately concerned about their personal risk of developing cancer, and approximately 20% were extremely worried. This was particularly so for individuals who had a family history, of whom nearly 50% considered themselves to be at a higher risk than the general population. Although the knowledge of cancer in the family was associated with a higher perceived risk, there was no relation between this knowledge, and an individual's attitude towards chemoprevention and surgery. One main consideration is that the respondents had not been counselled as to their personal risk of cancer; as such, it would have been difficult to seriously consider their risk of getting cancer and hence measures to avert it.

One major limitation of this study is the sample population. In view of the fact that we used opportunistic sampling to gather approximately 100 replies, it is only a small sample of individuals, and therefore cannot be considered representative of the Singaporean population. Another limitation is that our questionnaire was not detailed enough. We felt that specific description of the surgery might have made it difficult for non-female patients to answer the question. Similarly, this is why we did not include specific screening practices. The main aim of this survey was to serve as a first step towards a more formal study of this

nature in order to determine the general view of individuals in Singapore towards preventive measures such as prophylactic surgery and chemoprevention medications.

In 2001, we set up a high-risk familial cancer clinic in order to counsel individuals with a strong family history of cancer. As part of a high-risk assessment study, approximately one-third of individuals who were deemed suitable for genetic testing chose not to know their test results (unpublished data). One possible explanation for this is that many of these patients have had either breast or ovarian cancer. However, it is disconcerting that this may also reflect the choice of the family of the potential mutation carriers. Certainly, the impact on the psychological health of individuals in Singapore before and after prophylactic surgery would also have to be studied. It has been shown that there is a general decrease in the anxiety level once prophylactic surgery has been performed¹⁷⁻¹⁹ but the potential psychological trauma that results from the alteration of physical image and function cannot be underestimated. In addition, there may be a certain degree of “acceptance of fate” in these individuals, which may again be inversely proportional to education.²⁰ Further studies of this population of individuals at very high risk of cancer and understanding the process of decision making in prophylactic surgery and chemoprevention will contribute to our understanding of risk reduction and prevention in Singapore.

REFERENCES

1. Statistics; Health Facts Singapore 2003. Available at: <http://www.moh.gov.sg>. Accessed 9 November 2004.
2. Ang P, Garber JE. Genetic susceptibility for breast cancer – risk assessment and counseling. *Semin Oncol* 2001;28:419-33.
3. Calderon-Margalit R, Paltiel O. Prevention of breast cancer in women who carry BRCA1 or BRCA2 mutations: A critical review of the literature. *Int J Cancer* 2004;112:357.
4. Hartmann LC, Sellers TA, Schaid DJ, Frank TS, Soderberg CL, Sitta DL. Efficacy of bilateral prophylactic mastectomy in BRCA1 and BRCA2 gene mutation carriers. *J Natl Cancer Inst* 2001;93:1633-7.
5. Tsao AS, Kim ES, Hong WK. Chemoprevention of cancer. *CA Cancer J Clin* 2004;54:150-80.
6. Fisher B, Costantino JP, Wickerham DL, Redmond CK, Kavanah M, Cronin WM, et al. Tamoxifen for prevention of breast cancer: report of the National Surgical Adjuvant Breast and Bowel Project P-1 Study. *J Natl Cancer Inst* 1998;90:1371-88.
7. Eisinger F, Alby N, Bremmond A, Dauplat J, Espie M, Janiaud P, et al; the French National Ad Hoc Committee. Recommendations for medical management of hereditary breast and ovarian cancer. *Ann Oncol* 1998;9:939-50.
8. Chia KS, Seow A, Lee HP, Shanmugaratnam K. Cancer incidence in Singapore 1993-1997. Singapore: Singapore Cancer Registry, 2000:124-5. Report No. 5.
9. Ng EH, Ng FC, Tan PH, Low SC, Chiang G, Tan KP, et al. Results of intermediate measures from a population-based randomized trial of mammographic screening prevalence and detection of breast carcinoma among Asian women: the Singapore Breast Screening Project. *Cancer* 1998;82:1521-8.
10. Straughan PT, Seow A. Attitudes as barriers in breast screening: a prospective study among Singapore women. *Soc Sci Med* 2000;51:1695-703.
11. Burke W, Daly M, Garber J, Botkin J, Kahn MJ, Lynch P, et al. Recommendations for follow-up care of individuals with an inherited predisposition to cancer. II BRCA1 and BRCA2 Studies Consortium. *JAMA* 1997;277:997-1003.
12. Eisinger F, Geller G, Burke W, Holtzman NA. Cultural basis for differences between US and French clinical recommendations for women at increased risk of breast and ovarian cancer. *Lancet* 1999;353:919-20.
13. Hartmann LC, Schaid DJ, Woods JE, Crotty TP, Myers JL, Arnold PG, et al. Efficacy of bilateral prophylactic mastectomy in women with a family history of breast cancer. *N Engl J Med* 1999;340:77-84.
14. Rebbeck TR, Lynch HT, Neuhausen SL, Narod SA, Van't Veer L, Garber JE, et al. Prophylactic oophorectomy in carriers of BRCA1 or BRCA2 mutations. *N Engl J Med* 2002;346:1616-22.
15. Brain K, Gray J, Norman P, Parsons E, Clarke A, Rogers C, et al. Why do women attend familial breast cancer clinics? *J Med Genet* 2000;37:197-202.
16. Fry A, Rush R, Busby-Earle C, Cull A. Deciding about prophylactic oophorectomy: what is important to women at increased risk of ovarian cancer? *Prev Med* 2001;33:578-85.
17. Hatcher MB, Fallowfield L, A'Hern R. The psychosocial impact of bilateral prophylactic mastectomy: prospective study using questionnaires and semistructured interviews. *BMJ* 2001;322:76.
18. van Oostrom I, Meijers-Heijboer H, Lodder LN, Duivenvoorden HJ, Van Gool AR, Seynaeve C, et al. Long-term psychological impact of carrying a BRCA1/2 mutation and prophylactic surgery: a 5-year follow-up study. *J Clin Oncol* 2003;21:3867-74.
19. Schwartz MD, Kaufman E, Peshkin BN, Isaacs C, Hughes C, DeMarco T, et al. Bilateral prophylactic oophorectomy and ovarian cancer screening following BRCA1/BRCA2 mutation testing. *J Clin Oncol* 2003;21:4034-41.
20. Ong KJ, Back MF, Lu JJ, Shakespeare TS, Wynne CJ. Cultural attitudes to cancer management in traditional South-East Asian patients. *Australas Radiol* 2002;46:370-4.