

# Factors predicting the body image in thai cancer patients with serpentine sup ravenous hyperpigmentation

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## ABSTRACT

**BACKGROUND:** Serpentine Supravenous Hyperpigmentation (SSH) is a rare adverse side effect in cancer patients after receiving chemotherapy. Disfigurement of skin may affect the patients' feeling, behaviors, and thoughts, which may then impact their daily living and body image. To predict factors affecting body image of Thai cancer patients with Serpentine supravenous hyperpigmentation.

**MATERIALS AND METHODS:** This cross-sectional research involved 80 cancer patients with SSH who received chemotherapy at Vajira hospital from November 2020 to January 2021. Three instruments were used: 1) personal information, disease and treatment questionnaires, 2) a Serpentine Supravenous Hyperpigmentation Distress Scale (SSH-Distress Scale) developed by the principal investigator and colleagues from the literature review, and 3) a Body Image Scale (BIS), developed by Hopwood and colleagues. Alpha Cronbach's coefficient for the SSH-Distress Scale was 0.86; and the Body Image Scale was 0.94. Data was analyzed by descriptive statistics and multiple regression using enters

technique.

**RESULTS:** Results showed that types of cancer ( $b=-2.380$ ,  $p=0.023$ ), and distress from SSH ( $b=0.923$   $p<0.001$ ) could predict body image 52.9%, whereas gender and age could not predict the body image in cancer patients who had SSH from chemotherapy.

**DISCUSSION:** This study demonstrated that cancer patients with SSH suffered from this symptom distress was low to moderate level; and high body image satisfaction. For the symptom distress, the result was congruent with previous studies. These previous studies found that symptom distress was highly correlated with the body image and could predict body image.

**CONCLUSION:** Results from the study can be used as evidence to provide nursing care to help reduce distress and promote body image satisfaction in cancer patients from SSH. This could lead to an improvement in the quality of life in Thai cancer patients with SSH.

**Key Words:** *Body image; Thai cancer patients; Serpentine supravenous hyperpigmentation; Factors predicting*

## INTRODUCTION

Chemotherapy is commonly administered for cancer treatment worldwide. It is usually administered for two purposes, curative and palliative care in cancer patients. Although there are many adverse effects occurring in patients after receiving chemotherapy, Serpentine Supravenous Hyperpigmentation (SSH) is a rare complication from chemotherapy that patients may be concerned about. SSH was first described by Hurshesky in 1976 [1]. It is a vasculo-cutaneous entity that occurred in cancer patients who received 5- fluorouracil monotherapy per peripheral infusion [1,2]. Other agent's i.e. antineoplastic agent, combination agents can also

cause SSH [2-5]. In Thailand, cancer patients cannot claim for the cost of port insertion for chemotherapy administration from Universal Coverage. This leads to a number of cancer patients suffering from SSH. SSH is characterized by linear or serpentine streaks of hyperpigmentation following the traces of veins [2-5] through which the antineoplastic agent has been infused [1-6]. Occurring from time to time in each cycle of chemotherapy, disfigurement of the skin may disturb a patient's daily living activities, their socialization with others, working environment, or exercise routine. Therefore, SSH has an impact on the body image of those patients.

Body image is defined as an individual perception which includes thoughts, feelings, and perceptions about the body, with links to

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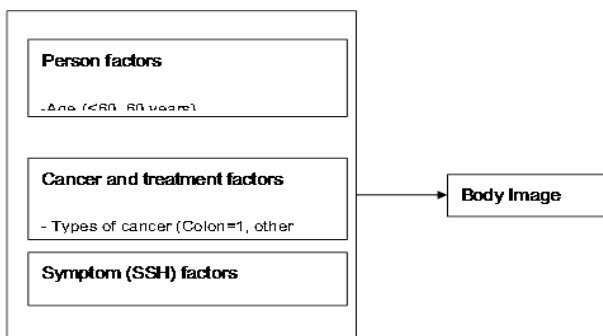
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social factors [7]. Hopwood et al. also identified three areas that are characteristics of the complex concept of body image. These include the affective (feeling), behavioral (avoiding people because of appearance), and cognitive (satisfaction with appearance, or with scar) [8]. Majority alteration of body image may often be a result of cancer and its treatment through loss of body parts or skin disfigurement such as scarring. Body image satisfaction has been studied in women with breast [9, 10], gynecologic cancer [11,12] as well as patients with head and neck [13,14] or childhood-adolescent cancer [15,16]. Results have shown that body image was influenced by cancer treatment such as surgery, radiation therapy, and chemotherapy. However, SSH is a visible disfigurement in cancer patient's skin. It may have more influence on body image than other kinds of cancer treatment. Little is known about body image in cancer patients who had SSH after receiving chemotherapy. There have only been minimal reported case studies [1-6]. SSH is disregarded by health care providers because it is benign, persistent, and will decline after chemotherapy treatment is completed. In a clinical setting in Thailand, we found some cancer patients with SSH suffered from losing body image. They did not want to go outside to do normal activities such as shopping, exercising, or even their jobs. They were stigmatized by their neighborhood as drug addicts, looking ugly like a dead person. This low body image resulted from SSH.

In cancer patients who have SSH after receiving chemotherapy, they have to face huge distress not only from the cancer itself but also its side effects from treatment. Combined with SSH, the patients must need more effort to cope with body image loss. SSH may affect a patients' self-perception, thoughts and feelings, with links to social factors. They cannot do their daily living as usual which may influence their quality of life. Females and young patients who had SSH, had less body image satisfaction than older patients. This is because they have to do more activities such as work and socialize with people compared to older patients. Types of cancers may relate with kinds of chemotherapy for treatment. Kinds of chemotherapy protocol may relate to SSH in cases of patients who received chemotherapy via peripheral infusion. The distress from SSH might be related to body image. From the literature review, little is known about factors influencing body image. To assess factors that may influence the body image in cancer patients with SSH is necessary for health care providers to reduce those factors and provide the optimal body image satisfaction and a to return to normal life.



**Figure 1) Purposes of the study:** Purposes of this study were to examine the body image, and factors predicting the body image in cancer patients with SSH

## MATERIALS AND METHODS

This cross-sectional research was descriptive predictive study design. Participants were 80 cancer patients who had SSH after receiving chemotherapy and willing to participate in the study (Figure 1). Data were collected during November 2020 to January 2021 at chemotherapy ward Vachira hospital, one university hospital in Bangkok. Sample sizes was calculated by using the Free Statistics Calculators version 4.0: A-Priori sample size for multiple regression [17-20]. Then, the power 0.80, alpha 0.05, 4 predictors, with effect size 0.16 was used. 80 participants were an appropriate sample size for this study.

### Instruments

The instruments used were:

- Personal information, disease, and treatment questionnaires
- SSH Distress Scales questionnaires developed by the principal investigator and colleagues from the literature review
- The Body Image Scale developed by Hopwood and colleagues (2001) [8]

Data information were:

- Personal information, disease, and treatment questionnaires developed from the literature review by the principal investigators
- SSH Distress Scales questionnaires developed by the principal investigator and colleagues from the literature review. The SSH Distress Scales questionnaires consists of 10 activities that were disturbed by SSH, those were a) itching or pain; b) embarrassment; c) interference in shopping; d) choosing clothes; e) socialization effect; f) sport difficulty; g) problems at work or studying; h) problems with partner, friends, or relatives; i) sexual difficulties; and j) treatment problem. It included 10 items, each item was divided into a 4-point Likert scale items. The scores ranged from 0 (Not at all); 1 (A little); 2 (A lot); and 3 (Very much). All scores from the 10 items were summed for distress. All possible scores varied from 0 to 30. Higher scores reflected the higher distress from SSH. The SSH Distress Scales questionnaire was validated by three experts; an oncology physician, a nursing faculty, and an advanced nurse practitioner. The content validity index (CVI) was calculated and equaled 0.95. Reliability was tested in 20 cancer patients with SSH. Cronbach's alpha coefficient of the SSH Distress Scales questionnaires was 0.95 in 20 patients before data collection. In addition, it was tested in 80 patients after finishing data collection. Then, Cronbach's alpha coefficient for this study was 0.86.
- The Body Image Scale (BIS) self-report questionnaire was developed by Hopwood and colleagues (2001) [8]. It was used to assess patients' perception of body image divided into three parts; affective items; cognitive items; and behavioral items. It consists of 10 items; each item of the BIS is measured by a 4 point Likert scale. The scores range from 1 (Not at all), 2 (A little), 3 (Quite a bit), and 4 (Very much). All 10 items are formulated "negatively". Scores were summed with possible scores varying from 10 -40. Lower scores reflected a higher body image. The Body Image Scale self-report questionnaire was allowed to be translated to Thai by Cheewapoonpol in 2004 [9]. It was well established by experts. The Content Validity Index (CVI) was 1. The BIS self-report questionnaire has been used by Thai investigators in breast cancer patients with Cronbach's alpha coefficient of body image scale was 0.89

[9]. Reliability for the BIS self-report questionnaire was tested in 20 cancer patients with SSH before data collection. Cronbach's alpha coefficient of the BIS Scale self-report questionnaire was 0.95. In addition, it was tested in 80 patients after finishing data collection. Then, Cronbach's alpha coefficient for this study was 0.94

**Protection of human rights**

This study was submitted to the Committee on Human Subjects of the organizational institute. It was approved by the committees from the Faculty of Medicine Vajira hospital and Navamindrahiraj University, Bangkok, Thailand. Research process started after the study was approved.

**Statistical analysis**

Data was analyzed by SPSS for Windows version 21.0 (IBM-SPSS Inc., Chicago, IL, USA), with the statistics as the following.

- The gender, age, and type of cancer in cancer patients with SSH after receiving chemotherapy were analyzed by frequency and percentage
- The distress from SSH and body image were analyzed by mean, standard deviation, and range (minimum to maximum)
- Factors predicting the sense of coherence in women with breast cancer after treatment were analyzed by multiple regression using enter technique. Multiple regression analysis used 4 independent variables; age (less than 60 years=1, and more than or equal to 60 years= 0); gender (female=1, male=0); types of cancer (CA Colon=1, Other cancer=0), and symptom distress from SHH (score 0-30), to predict one dependent variable (body image), with the significant level at 0.05. The multiple regression equation of this study is:

$$Y = \beta_0 + \beta_1(Gender) + \beta_2(Age) + \beta_3(Type\ of\ cancer) + \beta_4(Distress\ from\ SSH)$$

**RESULTS**

**Table 1**  
**Characteristic of cancer patients with SSH after chemotherapy (n = 80)**

Variables	N	%
Gender		
Male (male=0, reference)	45	56.25
Female (female =1)	35	43.75
Age (year) mean 59.43 years (SD=11.06) range from 26-83 years		
Less than 60 (=1)	36	45
More than or equal to 60 (= 0, reference)	44	55
Type of cancers		
CA Colon (=1)	49	61.25
Other cancer (breast, head & neck, stomach = 0 reference)	31	38.75
SSH Distress mean=5.32 (SD=4.61) min-max=0-21, possible range=0-30		
Body Image mean=16.44 (SD=5.95) min-max=10-35, possible range=10-40		

Results found that more than half of the participants were male (56.25%), age more than or equal to 60 years (55%), and a majority (61.25%) were diagnosed with colon cancer. The mean scores of SSH distress were 5.32 (SD = 4.61), ranging from 0-21, with possible range 0-30. The average scores of the body image were 16.44, SD = 5.95, ranging from 10-35, with possible range 10-40. Data information is shown in Table 1 and Table 2.

**Table 2**  
**Factors predicting the body image in cancer patients with SSH after chemotherapy (n = 80)**

Variables	b	SE b	Beta	R	R <sup>2</sup>	t	Si g.
Gender (female=1)	1.24	0.95	0.10	0.0	0.0	1.3	0.19
Age (less than 60 = 1)	-0.115	1.01	-0.01	0.1	0.0	-0.114	0.91
Type of cancer	-2.38	1.02	-	0.1	0.0	-2.323	0.02
SSH Distress	0.923	0.10	0.71	0.7	0.5	8.827	<.001

Constant=12.491 R square=52.9% SE=Standard error, Y=12.491+1.240 (Gender)(ns)-.115(Age)(ns)-2.380 (Type of cancers)+ .923 (Distress from SSH), (ns)=non-significant

**DISCUSSION**

Results found that the average age of cancer patients with SSH from this study was 59.43 years (Table 1). This result is not congruent with previous studies which studied body image in Thai patients with breast cancer (54.54 years) [10], gynecologic cancer patients (53.9 years) [11], and female cancer survivors with head and neck (50.85 years) [14]. These might be common in women who had malignant organs. However, the average age might depend on the type of cancer. The mean of SSH distress was 5.32, with a possible range score of 0-30. This result is congruent with one previous study of the distress from pruritus in patients with cholangiocarcinoma [21]. The mean of SSH distress is quite low. This can be explained that cancer patients who had low distress from the skin disfigurement because it did not pain, persistent, can be decline when stopping chemotherapy. However, the visible traces of veins can affect cancer patients because there were a lot of traces of veins around two arms and it took time to decline after treatment. Moreover, patients have to cope with cancer, its side effects, and the linear hyperpigmentation following the traces of veins. This may disturb patients' daily living routine, outdoor activities, and socialization with others. For the mean body image of 16.44, with a possible range score of 10-40. The result is not congruent with previous studies in patients with breast cancer and in gynecologic cancer patients without depression (15.0) [11], As well as it is congruent with gynecologic cancer patients with depression (16.9) [11]. It is interesting that cancer patients with SSH had body image as the same in cancer patients with depression. Even though more than half of the participants in this study were male, they were also affected by the SSH. This can be explained in that SSH can be easily seen by other people around them. This might be an obstacle for patients to conduct their daily life. In addition, body image is one component to assess the quality of life [9]. Then, the body image may equally affect both genders (Table 2). Results from this study also reported that factors that could predict body image were types of cancer and the distress from SSH, however, factors that could not predict body image were gender and age.

When considering types of cancer and distress from SSH, results showed that both factors were higher affecting the body image in cancer patients with SSH after receiving chemotherapy. This result is congruent with previous studies. Types of cancer found a negative effect on body image in cancer patients with SSH. This can be explained in that chemotherapy protocol was linked with types of cancer. Then, the SSH that can occur depending on chemotherapy and it may affect the cancer patients' body image. Another result of this study demonstrated that cancer patients with SSH suffered from this symptom distress was low to moderate level; and high body image satisfaction. For the symptom distress, the result was congruent with previous studies. These previous studies found that symptom distress was highly correlated with the body image and could predict body image [10, 11]. This is because when patients have distress from SSH, it may affect their affective, cognitive, and behaviors. Then, it can be claimed that the patients with higher distress had a strong influence on body image. For this issue, health care providers must be concerned with assessing and relieving the SSH distress during treatment with chemotherapy. Symptom management strategies should be focused for relieving the SSH and integrate intervention to promote the body image satisfaction in cancer patients who had SSH. Those interventions might be 1) a multidisciplinary educational rehabilitative program [22] or 2) using psychosocial effects of a skin camouflage program [23] to reduce SSH distress and improve the body image. In the case of gender and age, these factors could not predict the body image. This result could be explained in that both gender and age of the participants who had SSH after receiving chemotherapy. SSH may affect the body image in the same way. Then, gender and age could not predict the body image satisfaction. However, age could not predict the body image either. The result is not congruent with previous study. This might be because the average age of the participant was 59.43 years. These participants were middle aged and fulfilled with life experience which they can cope with the SSH in the same meaning. They may affect (a) self-perceptions of feelings (affective), (b) self-perceptions of thoughts to mobilize resources to deal with SSH distress (cognitive), and (c) behavioral changes to cope with the SSH (behaviors) in the same way. Then it cannot predict the body image satisfaction in cancer patients with SSH. For this issue, health care providers must be concerned to assess the distress in young cancer patients in both genders.

## CONCLUSION

It can be concluded that types of cancer and the distress from SSH were strong predictors of the body image in Thai cancer patients. Health care providers should reduce distress from SSH to improve the patients' body image. The cancer patients with low distress will have confidence to use their cognitive and adjust their feelings and behaviors for appropriate daily living including outdoor activities, and socialize with people around them. Then, it will improve their quality of life in cancer patients with SSH.

## What is already known on this topic?

The descriptive aspect of the Serpentine supravenuous hyperpigmentation, factors promotion and reduction of the symptom, perception of the severity and distress, and body image in cancer patients with SSH after receiving chemotherapy have been studied in Thailand. Needed is to study the factors predicting the body image in cancer patients in Thailand.

## What this study adds

This is the first study of factors predicting the body image in Thai cancer patients with Serpentine supravenuous hyperpigmentation after receiving chemotherapy.

## CONFLICT OF INTEREST

The authors have no conflicts of interest to disclose.

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