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Supportive Care

Chemotherapy-Induced Alopecia: Can We Measure the Level of Distress in Oncology Patients? (The ALDO Study)

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Abstract

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Chemotherapy-induced alopecia (CIA) has a strong and definite negative impact on body image in terms of perception of aging, depression, loss of interest, and confidence. This study involved the translation and validation of the chemotherapy-induced alopecia distress scale (CADS) into Hindi and Marathi (stage I) and the translated versions were used to assess the distress level associated with CIA at our tertiary care center (stage II). The level of distress associated with CIA was measured in terms of mild, moderate, and severe distress. The majority of the patients (58.66%) experienced severe distress due to CIA. The study demonstrates the validity and reliability of the CAD scale in our population. Indian married women with higher age group with cancer are affected more due to CIA. There was no significant association between socioeconomic status, number of chemotherapy cycles received, frequency of chemotherapy administration, and CIA distress. CADS is valid and predictive of the presence of severe distress in our chemotherapy patients. The treatment or prevention of CIA should be preceded by the counseling and support provided by the chemotherapy nurses.

Keywords

- chemotherapy-induced alopecia
- distress
- distress scale
- quality of life

Introduction

Chemotherapy-induced alopecia (CIA) casts a strong and definitely negative impact on body image in terms of perception of aging, depression, loss of interest, and confidence. Alopecia enhances vulnerability in the patient's mind with a constant reminder of illness and the doom of cancer.[1]

Although transient and mostly reversible, CIA is devastating consequence of systemic anticancer therapy for many patients especially females with significant psychological

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and social impact.[2,3] Associated emotional trauma may lead to refusal or delay in the anticancer treatment.[4] Usually, distress with CIA (CAD) is not considered worthy enough reporting and, when it is reported, it demonstrates reduced quality of life.[5] CAD scales are available in Italian and Chinese version.[3,6,7] Therefore, handling CAD is the need of the hour.

Methodology

This study deals with translation and validation of chemotherapy-induced alopecia distress scale (CADS)[3] into Hindi and Marathi (stage I); the translated versions can be used to assess distress level in larger population (stage II) at our tertiary cancer center.

The secondary objectives were to assess CAD in different malignant conditions, different regimens and to compare association between socioeconomic, clinical, and demographic data of patients with CAD in larger population.

This study was conducted in two stages. In stage I, nonexperimental descriptive research design was used and in stage II cross-sectional survey research design was used for the study. A non-probability convenient sampling technique was used. Sample size was 30 for stage I and 300 for stage II. The Clinical Trial Registry of India registration number was CTR/2020/02/02335.

Stage I

Content Validity

Part A: Permission from concerned organization was taken before using CADS for the study. Also, permission was obtained for translating CADS into Hindi and Marathi.
Part B: The tool was validated from nine experts including medical oncologists, nurses, and psychologist. Few modifications were made after the suggestion of experts and content validity was established.

Reliability

Data was summarized using mean and standard deviation and median and interquartile range for normal and non-normally distributed data for all separate domains. Construct validity was assessed by discriminant and convergent validity,and was explored by use of psychometric techniques of analysis of scaling, using correlations between items and scales (item–Scale), and correlation between scales (scale to scale) respectively. For convergent validity, the 42 items within a scale were to be moderately or highly correlated (>0.40) with their own scale. For discriminant validity, to indicate that the two scales were different in construct, scale to scale correlation coefficient of less than 0.70 was required. The Kaiser-Meyer-Olkin was the measure of sampling adequacy, which varied between 0 and 1. Construct validity was established by exploratory factor analysis using varimax method and principal component analysis for extraction. The analyses were performed by using the criteria of Eigen value 1 and the screen-plot method. Internal consistency of the multi-item questionnaire was assessed by use of Cronbach's α coefficient, which was used to indicate scale of reliability.

Data Collection

Data collection was done by using CADS. CADS was first translated in Marathi and Hindi language. CADS consisted of 25 items based on five domains: physical,[2] emotional,[8] daily activity,[8] relationship,[5] and treatment.[2] A four-point Likert scale on each statement scoring degree of distress on CADS was as follows: 1 = not at all, 2 = a little, 3 = quite a bit, 4 = very much. Total scores were calculated by summing responses for all items; higher scores meant more distress due to CIA. In addition to CADS, tool also included demographics, socioeconomic, and clinical characteristics—age, sex, marital status, education, Kuppuswamy socioeconomic scale, data related to disease and chemotherapy, and measures undertaken by patient for alopecia management are also included in the tool.

Association between severity of CIA with age, gender, marital status, socioeconomic status, and diagnosis was analyzed using chi-squared test. A *p*-value less than 0.05 in a two-tailed test was considered statistically significant.

Then CADS was administered to 30 participants. Construct validity was assessed by discriminant and convergent validity. Convergent validity was performed by using Spearman's rank correlation. Reliability was checked by Cronbach's α coefficient.

Stage II

Stage II was conducted with 300 samples at Tata Memorial Hospital, Mumbai. Data was gathered and analyzed by using descriptive and inferential statistics.

Results

In our study, approximately 40% of the patients were under the age of 40 years and majority (71.3%) were females, 75.7% of patients were married, around 47.0% of patients belonged to lower middle class, most patients (35.3%) involved in the study had breast cancer (►**Fig. 1**), most patients (65.3%) noticed alopecia after first cycle of chemotherapy, majority of the patients (67.7%) received chemotherapy once in 3 weeks, and the majority (78.0%) used a scarf to cover the head (►**Supplementary Table S1** [available in the online version]). The median time to develop alopecia was 25.3 days.

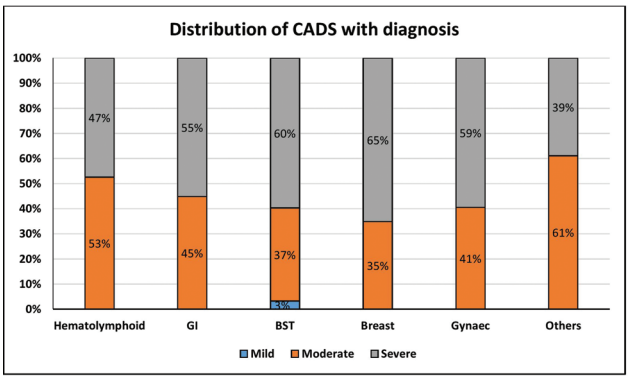

Fig. 1 Distribution of chemotherapy-induced alopecia distress scale (CADS) with diagnosis.

Table 1 Construct validity and internal consistency of scores for CADS scale

	Cronbach's α	Inter-item correlation	Inter-item correlation significance value	Scale-scale DV validity
Items (1–2) Physical	0.264	0.152	0.512	−0.186–0.416
Items (3-10) Emotional	0.87	0.137–0.765	<0.001	−0.352–0.358
Items (11–16, 18, 20) Activity	0.832	0.178–0.718	<0.001	−0.186–0.287
Items (17,19,21–23) Relationship	0.232	0.443–0.719	<0.001	−0.233–0.336
Items (24-25) Treatment	0.559	0.396	0.029	−0.328–0.366
Overall reliability	0.882			

Abbreviations: CADS, chemotherapy-induced alopecia distress scale.

Table 2 Distress levels

Scores	CADS Score	Frequency	Percentage
Mild	0–33	2	1.0
Moderate	34–67	122	40.66
Severe	68–100	176	58.66

Abbreviations: CADS, chemotherapy-induced alopecia distress scale.

Convergent validity: All the items have a correlation more than 0.4 except the physical domain. (►**Table 1** and ►**Supplementary Table S2** [available in the online version]).

Construct validity internal consistency: Internal consistency of the multi-item questionnaire was assessed by use of Cronbach's α coefficient. For the physical domain, Cronbach's α was calculated as 0.264, Cronbach's α was 0.87 for the emotional domain, and 0.832 for the activity domain. The overall reliability for the 25 items was 0.882. Hence, the questionnaire proved to be a reliable tool (►**Table 1**).

The level of distress associated with CIA was measured in terms of mild, moderate, and severe distress. The majority of the patients (58.66%) experienced severe distress due to CIA (►**Table 2**).

Higher the age, more was the severity of CIA distress (p-value <0.022). Females had severe CIA distress than males (p-value <0.001). Married patients had more severe distress than unmarried and widow patients (p-value < 0.011). Most of the patients experienced severe CIA distress after first cycle of chemotherapy administration (p-value <0.041).

There was no significant association between socioeconomic status, number of chemotherapy cycles received, frequency of chemotherapy administration and CIA distress.

Discussion

Our study revealed that majority of the patients (58.66 %) had severe CAD and breast cancer patients had severe (65.09%) CAD. Münstedt et al in his longitudinal study on ovarian cancer assessed patients who had complete alopecia, in which 73.3% had lack of confidence due to alopecia.[8] Machado et al also identified chemo-induced permanent alopecia after hematopoietic stem cell transplantation[9] affecting the overall quality of life of these patients. Indian women especially those who were married with higher age group cancer patients were affected more due to CIA. This might also reflect the impact on the body image on married women than unmarried young women.

Since the CAD was higher even after first cycle and was not affected by the number of cycles or frequency of the cycles, the thought of alopecia even before it developed would put these women through severe CAD. These findings may be useful especially when it comes to developing coping strategies for the CIA. The treatment or prevention of CIA should be preceded with the counseling and support provided by the chemotherapy nurses, to bring down the severity of CAD.

The CAD is severe irrespective of socioeconomic status of the patients adding an important perspective to the coping strategies. Since this study includes patients with various solid and hematolymphoid malignancies, it broadens the thought process required to deal with the CAD.

There are certain limitations to our study. A larger sample size is required to assess its generalization across all the malignancies. The use of coping strategies in a randomized trial is the need of the hour. Our study was a prospective nonrandomized single-center noninterventional study.

Conclusion

CADS is valid and predictive of the presence of severe distress in our patients receiving chemotherapy. This scale can be used for assessment in clinical areas and the more sensitive area of alopecia can be addressed at the earliest by the caring nurses and physicians.

Conflict of Interest
None declared.

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