Post debridement – Mental health and body image satisfaction among mucormycosis patients: Concern beyond surgical debridement

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Abstract:

A sudden surge in the cases of mucormycosis forced India's coronavirus disease 2019 task force to issue evidence-based advisory on the disease. Severity was seen as comparatively high among diabetic and immuno-compromised individuals. Surgical procedures leading to scars of incision and disfigurement of the face might trigger dissatisfaction with body image and poor mental health. The study was conducted to assess mental health and level of satisfaction with body image among patients diagnosed with mucormycosis during the post-operative period. A descriptive cross-sectional study was conducted among patients diagnosed with mucormycosis who underwent surgical debridement in a tertiary care hospital among 56 patients selected by the total enumeration sampling technique. Data were collected using DASS-21 and a modified version of the body image scale. Among 56 patients, most participants (n = 43) were highly satisfied with their body image. In terms of mental health, patients reported mild levels of depression (12.5%), anxiety (7.1%), and stress (1.8%) after surgery. Body image scores were positively correlated with stress scores (r = 0.323) at $P < 0.05$. Among the sub-scales of mental health, scores of anxiety and stress were found to be correlated (r = 0.457) at $P < 0.01$. A statistical association was found between occupational status and level of depression ($\chi^2 = 13.501$, $P = 0.007$), body image and number of post-operative days ($\chi^2 = 13.654$, $P = 0.033$), and body mass index and level of depression ($\chi^2 = 12.396$, $P = 0.005$). Early identification of predictors of mental health disorders due to dissatisfaction with body image among post-debridement mucormycosis patients could help in planning psycho-social interventions.

Keywords:

Anxiety, body image, depression, mental health, mucormycosis, stress

Introduction

The rising trend in cases of mucormycosis or zygomycosis has been reported among patients during the second wave of coronavirus disease 2019 (COVID-19). Globally, the prevalence of mucormycosis varied from 0.005 to 1.7 per million populations, while it was nearly 80 times higher (0.14 per 1000) in India compared to developed countries, according to a recent estimate for 2019–2020.[1] The factors that contributed to the emergence of mucormycosis were uncontrolled diabetes mellitus (specifically among patients with ketoacidosis), immuno-suppressive conditions such as solid tumors, human immuno-deficiency virus/acquired immuno-deficiency syndrome, treatment with glucocorticosteroid agents, hematological malignancies including neutropenia, and recipients of transplants.[2,3] The extensive proliferation of fungi results in poor drug penetration, which requires surgical intervention.[2] The

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rapid progression of infection to the cranium, specifically in immuno-compromised hosts, might result in deaths in cases with rhino-cerebral involvement, which could be prevented by aggressive surgical treatment.[4,5] The long-term complications associated with mucormycosis are lengthy hospital stays, substantial costs, and spiking death rates.[6]

Even though an aggressive surgical approach might be a life-saving measure, it leads to incision marks and facial disfigurement; since the face is the most unique and visible part of an individual identity, dissatisfaction might occur concerning one's appearance.[7] Marked body image dissatisfaction disturbed social functioning post-surgery has been reported among patients with cancer of the head and neck, and disturbance tends to further magnify in quantity in later weeks with depression, anxiety, and stress.[7-9]

The objective of the study was to examine body image and mental health among patients undergoing surgical intervention secondary to mucormycosis relationship between body image and sub-scales of mental health: depression, anxiety, and stress.

Materials and Methods

Study design
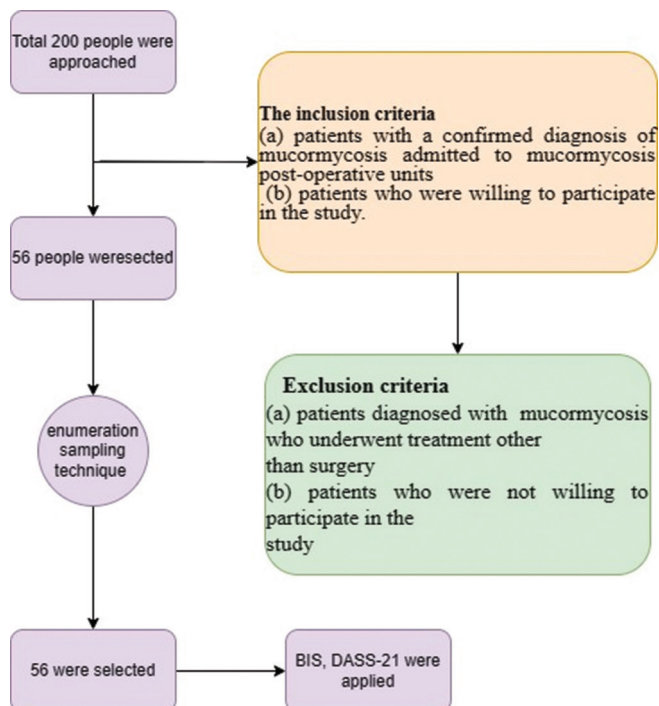A cross-sectional study was conducted from July 2021 to September 2021. Study setting: A tertiary care hospital [Figure 1].

Figure 1: Data collection procedure

Study participants and sampling
The target population were in-patients of mucormycosis post-operative units diagnosed with mucormycosis. Sampling: Total enumerative sampling was done, and the sample size was based on previous studies; the sample size was estimated at 20 and calculated using Fisher's formula [Figure 1].[10]

Data collection tools and techniques
Subjects were administered the tool-modified Body Image scale developed by Hopwood, which includes 10 items with a 4-point response format [ranging from not at all (0) to very much (3)], which is interpreted as highly satisfied (0–10), partially satisfied (11–20), and dissatisfied (21–30). An increase in the body image score indicated increased dissatisfaction with body image.[11] Mental health indicators were assessed using DASS 21, developed by a 21-item self-reporting scale with 7 items in each sub-scale.[12,13]

Ethical consideration
The participant in the formation sheet was given, informed consent was taken from the subjects, and the AIIMS Patna ethical committee approved the study. A statistical package for social science was employed to analyze.

Results

The study sample consisted of 56 patients with confirmed diagnoses of mucormycosis admitted to post-operative mucormycosis units at a tertiary care hospital in eastern India. Shapiro–Wilk test was used to check the normality of the data. All the outcome variables except stress were not normally distributed since their calculated value was lesser than the *P* value of 0.05, which concludes that applying the parametric test is unjustified.

Among 56 patients, 41 were males and 15 were females. The mean (±SD) body mass index of the subjects was 21.99 ± 3.368 kg/m^2, with the majority of them (n = 39) with a normal weight and a minority of them were malnourished (n = 8) and obese (n = 9). Most patients (n = 54) were married, one was single, and one was widowed. Thirty-five patients reported a family income of less than Rs. 50,000/month, 17 reported a monthly family income of Rs. 50,000–100,000, and a minority of the sample (n = 4) reported an income of more than Rs. 100,000 per month. Most participants (n = 42) resided in rural areas, while 14 lived in urban areas. Nearly half (n = 24) of the samples underwent endoscopic debridement, followed by open debridement (n = 19) and functional endoscopic sinus surgery (FESS) with endoscopic debridement (n = 13).

In terms of body image, the highest frequency of participants (n = 43) were highly satisfied with their

body image, followed by partially satisfied (n = 10) and a very low frequency of patients (n = 3) who were dissatisfied after surgical intervention [Figure 2]. Among 56 patients, a low frequency had mild levels of depression (n = 7, 12.5%), anxiety (n = 4, 7.1%), stress (n = 1, 1.8%), and severe levels of anxiety (n = 1, 1.8%) [Figure 3].

Mean scores of depression (4.86 ± 3.344), anxiety (3.39 ± 2.852), and stress (7.39 ± 3.735) among the study participants revealed that the majority of them had scores in the normal range as per the DASS21 scale, while a minority of them experienced mild levels of depression, anxiety, and stress. A severe level of stress was experienced by 1.8% of the respondents. The mean body image score was 7.52 ± 5.487, which indicated that the high frequency of the subjects were highly satisfied with their body image post-operatively.

Body image disturbances and stress were found to have a positive correlation, which interprets that if the body image disturbances increase, the stress score also increases and vice versa ($P < 0.05$). Similarly, the sub-scales of mental health, namely, anxiety and stress, showed a statistically significant correlation at $P < 0.01$, which indicates that an increase in the level of anxiety will increase the stress scores and vice versa [Table 1].

Body image and sub-scales of mental health association with the socio-demographic and clinical characteristics of the participants using Pearson's Chi-square test were observed. Fisher's exact test and Yates's correction were applied to calculate the association for socio-demographic characteristics, such as gender, religion, type of family, and place of residence, with levels of depression and stress as less than 80% of the cells had values ≥ 5. The findings revealed a statistically significant association between occupation and level of depression ($\chi^2 = 13.501$, $P = 0.007$), body mass index and level of depression ($\chi^2 = 12.396$, $P = 0.005$), and post-operative day and body image ($\chi^2 = 13.654$, $P = 0.033$).
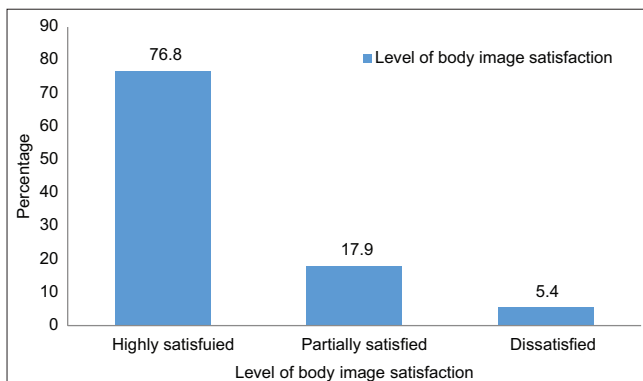
Discussion

Assessment of body image and identifying early predictors of depression, anxiety, and stress could be the need for early intervention for patients diagnosed with mucormycosis as incapacitation of poor mental health imposes a vicious cycle of disempowerment and coercion. The socio-demographic profile of the patients of the present study showed most of them (n = 32) had nuclear families, which was contrary to the study conducted by Zahid *et al.* among patients diagnosed with head and neck cancer who lived in joint families.[14] Having a joint family might have helped them get social support to fulfil responsibilities during hospitalization, reducing the patient's burden.[15] Among 56 patients, all of them reported to be diagnosed with COVID-19 prior to the development of mucormycosis. A study conducted by Patel *et al.*[16] found that rhino orbital presentation is the most common form of mucor infection, similar to our study in which all patients had nasal and orbital involvement. In the present study, clinical co-morbidity associated with most patients was diabetes mellitus (n = 30), followed by hypertension (n = 17). The results were similar to a previous study conducted before the COVID-19 pandemic by Prakash *et al.*, in which 57% of patients had uncontrolled diabetes, which was one of the predisposing factors that contributed toward the development of mucormycosis.[17] The study findings were contrary to the systematic review (May 2021), where patients with a history of hypertension and diabetes were

Table 1: Spearman's rho correlation between outcome variables *n*-56

Variables	Body Image *r* (*P*)	Depression *r* (*P*)	Anxiety *r* (*P*)	Stress *r* (*P*)
Body Image	1	0.107 (0.434)	0.101 (0.458)	0.323* (0.015)
Depression	xx	1	0.168 (0.216)	0.169 (0.214)
Anxiety	xx	xx	1	0.457** (<0.001)
Stress	xx	xx	xx	1

*P- Significant at 0.05 level **P- Significant at 0.01 level. df = (*n*-2) = 54

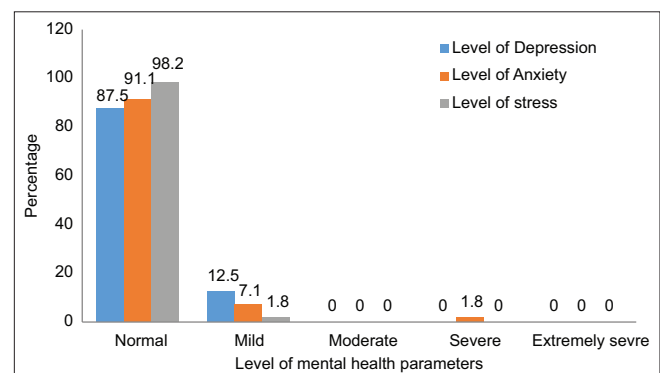**Figure 2:** Level of body image among participants

Figure 3: Level of mental health among participants

26% and 15%, respectively.[17] The diagnosis of mucormycosis exaggerated the co-morbidities, including diabetes mellitus being a major risk factor. The present study found a previous history of glucocorticosteroid treatment among patients diagnosed with mucormycosis. A systematic review of case reports of COVID-19 reported 76.3% of patients with a history of treatment with corticosteroids and a major involvement of upper respiratory tract such as rhino (88.9%) and rhino orbital (56.7%) forms among cases of mucormycosis.[17]

The patients assessed for mental health parameters in later post-operative days showed higher satisfaction with body image. The results were contrary to another study in which body image dissatisfaction among head and neck cancer patients increased from 11% pre-operatively to 25% at 1 month after surgery and 27% at 3 months after the completion of treatment. In this study, nearly half of the patients underwent endoscopic debridement, which showed lesser visible scar marks or disfigurement and greater improvement in body image satisfaction in the later weeks of the post-operative period.[8]

DASS-21 scores were in the normal range for the majority of the patients, with only a few reporting mild depression (12.5%), anxiety (7.1%), and stress (1.8%). The possible reason for normal mental health parameters in the present study could be more awareness regarding COVID-19, long-term admission requirements, and support from family members and the health care team, including members of psycho-social care providers.[11] Higher body image scale scores were correlated with higher scores of depression, anxiety, and stress among patients diagnosed with mucormycosis. Similar results were seen in head and neck post-surgery patients, which necessitates the need for early management of predictors of mental health after surgery for positive self-body image.[18] Differences in depression scores among self-employed patients could be related to lengthy hospital stays, pessimistic views about disease progression, and concerns related to job loss. Verdonck-de Leeuw V *et al.*[19] reported oral dysfunction, loss of appetite, deteriorated social functioning, and high levels of anxiety as barriers for head and neck cancer treatment survivors to return to work post-surgery.

Conclusion

The surge in post-COVID mucormycosis cases necessitates early identification of mental health predictors, and the adoption of endoscopic intervention for debridement proves promising in enhancing patients' body image. Proactive mental health management is crucial to prevent complications, ensuring a more comprehensive recovery for affected individuals.

Conflicts of interest

There are no conflicts of interest.

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