

Comprehensive Multidisciplinary Approach for Assessing and Managing Breast Nipple Discharge: Current Insights and Future Directions

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ABSTRACT

Objective: This study aimed to comprehensively evaluate and manage cases of breast nipple discharge utilizing a multidisciplinary approach at Saidu Group of Teaching Hospitals and Swat Medical Complex Teaching Hospital in Saidu Sharif, Swat, Pakistan.

Study Design: Clinical evaluation study

Place and Duration of Study: This study was conducted at the Saidu Group of Teaching Hospitals and Swat Medical Complex Teaching Hospital, Saidu Sharif, Swat, Pakistan from March 1, 2021, to May 31, 2022.

Materials and Methods: A total of 113 females aged 18 to 55 years were purposefully selected using non-random purposive sampling technique. Data collected from clinical examinations, laboratory reports, and radiological images were analyzed using the latest version of Statistical Package for the Social Sciences (SPSS) 24.

Results: Among the 113 participants selected for the study, 9 (14.51%) were aged 18-25 years, 52 (46.01%) were aged 26-35 years, 29 (25.66%) were aged 36-45 years, and 23 (20.35%) were aged 46-55 years. Clinical examination revealed unilateral discharge in 78 (69.02%) cases and bilateral discharge in 35 (30.98%) cases. Spontaneous discharge was observed in 21 (18.58%) cases, while non-spontaneous discharge was observed in 92 (81.41%) cases. Persistent discharge was noted in 18 (15.98%) cases, while intermittent discharge was reported in 95 (84.04%) cases. Additionally, nipple discharge was categorized by color: 27 (23.98%) cases had bloody discharge, 38 (33.62%) cases had green discharge, and 20 (17.69%) cases had yellow discharge. Cytopathology reports indicated 23 (20.35%) cases of papillomas and 68 (60.01%) cases of epithelial cells (most common), with 4 (3.53%) cases showing malignant cells.

Conclusion: This study demonstrates the efficacy of a multidisciplinary approach in assessing, diagnosing, and managing breast nipple discharge cases. Both conservative and surgical interventions were employed to effectively manage the condition. However, further research with a larger sample size and a more comprehensive multidisciplinary approach, coupled with increased resources, is recommended to enhance the accuracy of evaluation and management strategies for this condition.

Key Words: nipple discharge, cytopathology, malignancy, ductectesia

Citation of article: Usman M, Rahman S, Syed A. Comprehensive Multidisciplinary Approach for Assessing and Managing Breast Nipple Discharge: Current Insights and Future Directions. Med Forum 2023;34(8):221-224.doi:10.60110/medforum.340851.

INTRODUCTION

The presence of nipple discharge accounts for 2–5% of all healthcare visits by female patients and can serve as an early indicator of breast carcinoma in 5–12% of cases.¹

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Received: March, 2023

Accepted: May, 2023

Printed: August, 2023

Nipple discharge contributes to 3-9% of new referrals to breast clinics, amounting to an annual range of sixteen thousand to forty-seven hundred cases.^{2,3} A spectrum of pathological conditions can lead to nipple discharge, including duct ectasia and intra-ductal papilloma, necessitating the exclusion of carcinoma. The prevalence of cancer among patients presenting with nipple discharge varies between 2.7% and 24.2% across studies.^{3,4} Despite the considerable incidence, consensus regarding the evaluation and management of this significant condition remains elusive.

While the Association for Breast Surgery (ABS) revised its standards of practice in 2017 and 2019, these recommendations rely on limited evidence.⁵ Nipple discharge can occur spontaneously or as a result of breast manipulation, such as nipple squeezing.⁶ Determining whether the discharge is physiological or pathological depends on individual history and clinical

assessment. Physiological nipple discharge can manifest bilaterally and non-spontaneously, with colors ranging from brown to yellow, white, and green. Often linked to nipple stimulation, this discharge can be induced by manual manipulation.⁷ Pathological discharge, in contrast, is typically bloody, spontaneous, and originates from a single duct.⁸ While most cases of unilateral bloody discharge are associated with benign conditions like papilloma or duct ectasia, female breast cancer, accounting for 7-33% of cases, is a notable cause of spontaneous discharge.⁹

Despite its rarity, breast cancer can be identified as a cause. Research has demonstrated that fibrocystic alterations and other non-proliferative breast lesions are linked to the presence of fluids, including secreted materials, in a significant proportion of cases (94%). Additionally, ultrasound scans in patients with pathological discharge, inconclusive mammograms, have identified potential undetected cancers in 15% of instances.¹⁰ Notably, only 3% of women under the age of 40 diagnosed with breast carcinoma had nipple discharge as their primary symptom, compared to 32% of women over sixty years of age.¹¹

In light of the findings, this study has provided a comprehensive overview of breast nipple discharge characteristics and patterns among the 113 participants enrolled. The demographic distribution revealed a diverse age range, with significant representation across various age groups. The prevalence of unilateral and bilateral discharge, along with the proportions of spontaneous and non-spontaneous instances, underscores the complexity of this clinical concern. Moreover, the array of discharge colors and the spectrum of underlying pathologies, as indicated by cytopathology reports, emphasizes the need for meticulous evaluation and tailored management strategies. The robustness of a multidisciplinary approach has been underscored by the successful implementation of both conservative and surgical interventions, yielding positive outcomes in managing breast nipple discharge. However, the pursuit of future investigations with larger cohorts and more comprehensive approaches, alongside enhanced resource allocation, holds the promise of refining our understanding and refining the clinical management of this intriguing condition.

MATERIALS AND METHODS

The current study was conducted at Saidu Group of Teaching Hospitals and Swat Medical Complex Teaching Hospital, Saidu Sharif, Swat, Pakistan, spanning from March 1, 2021, to May 31, 2022, following the approval of the institutional review board. A total of 113 female participants, aged between 18 and 55 years, were purposefully selected using a non-random purposive sampling technique. Inclusion criteria encompassed individuals exhibiting persistent

or intermittent nipple discharge. Exclusion criteria included age exceeding 55 years and a confirmed history of malignancy.

The evaluation process involved a comprehensive triple assessment, which encompassed clinical examination, imaging, and cytological analysis of breast fluid. Additionally, medical histories were scrutinized to identify relevant factors such as diabetes mellitus, hypertension, thyroid dysfunction, epilepsy, prior breast surgical procedures, and medication usage including proton pump inhibitors and antidepressants. Characteristics of the nipple discharge, including unilateral or bilateral occurrence, color, persistence, and ductal origin, were meticulously recorded. Clinical breast examinations were conducted by experienced breast surgeons, covering all four quadrants of each breast.

Tailoring the diagnostic approach based on age, patients below 40 underwent breast ultrasound due to breast density considerations, while those above 40 were advised to undergo mammography. MRI tractography was employed in cases where initial results raised uncertainties. Thyroid function evaluations and serum prolactin levels were assessed for each participant. Patients with confirmed cytological evidence of breast cancer were excluded from the study.

Management strategies predominantly followed a conservative route, involving patient reassurance, avoidance of nipple manipulation, and addressing underlying causative factors when necessary. Surgical interventions, such as microdochectomy or total duct excision, were pursued for individuals experiencing frequent or bothersome discharge, particularly if it exhibited a bloody nature.

To analyze the collected data, the latest version of Statistical Package for the Social Sciences (SPSS) 24 was employed, enabling rigorous statistical examination and interpretation.

RESULTS

A total of 113 patients were enrolled in this study, encompassing individuals aged 18 to 55 years. Among them, 9 patients (14.51%) fell within the 18-25 years age range, 52 patients (46.01%) were aged 26-35, 29 patients (25.66%) were aged 36-45, and 23 patients (20.35%) were aged 46-55 [Table 1].

Clinical examination findings are summarized in Table 2. Among the patients, 78 (69.02%) exhibited unilateral nipple discharge, while 35 (30.98%) demonstrated bilateral discharge. Spontaneous discharge was noted in 21 cases (18.58%), while 92 cases (81.4%) displayed non-spontaneous discharge. Persistent discharge was documented in 18 patients (15.98%), whereas intermittent discharge was evident in 95 patients (84.04%). Furthermore, 27 cases (23.98%) presented with discharge of a bloody hue, 38 cases (33.62%) exhibited green-colored discharge, and 20 cases

(17.69%) displayed yellow-colored discharge from the breasts. Cytopathology assessments confirmed papillomas in 23 patients (20.35%), with epithelial cells being the most prevalent, observed in 68 patients (60.01%). Malignant cells were detected in discharge from 4 patients (3.53%).

Diagnostic imaging procedures were employed as follows: mammography was conducted for 59 patients (52.21%), ultrasonography was performed for 68 patients (60.17%), and MRI ductography was carried out for 32 patients (28.31%).

Table No. 1: Age Distribution of Participants and Incidences in Different Age Groups

Age (years)	Number	Percentage
18-25	09	14.51 %
26-35	52	46.01 %
36-45	29	25.66 %
46-55	23	20.35 %
Total	113	100 %

Table No. 2: Manifestation of Nipple Discharge, Discharge Color, Cytopathology, and Radiological Findings Across Different Age Groups

	Number	Percentage
Manifestations of the discharge		
Unilateral	78	69.02 %
Bilateral	35	30.98 %
Spontaneous	21	18.58 %
Non-spontaneous	92	81.41 %
Persistent	18	15.98 %
Intermittent	95	84.07 %
Single duct	38	38.93 %
Multiple ducts	75	66.37 %
Color of discharge		
Bloody	27	23.89 %
Milky	17	15.04 %
Green	38	33.62 %
Clear	11	9.73 %
Yellow	20	17.69 %
Cytopathology		
Papilloma	23	20.35 %
Epithelial cells	68	60.017 %
Malignant cells	4	3.53 %
Histiocytes	18	15.92 %
Radiological investigation		
Mammography	59	52.21 %
Ultrasonography	68	60.17 %
MRI of ductography	32	28.31 %

The outcomes of surgical interventions and histopathological findings are outlined in Table 3. Among the patients, 28 (24.77%) underwent microdochectomy, while 23 (20.35%) underwent total duct excision. Histopathology reports unveiled malignancy in 4 cases (3.53%), ductal ectasia in 20 cases (17.69%), and papillomas in 23 cases (20.35%).

Table No. 3: Surgical Interventions - Microdochectomy and Total Duct Excision, and Histopathology Findings for Nipple Discharge Cases

Surgical intervention	Number	Percentage
Microdochectomy	28	24.77 %
Total duct excision	23	20.35 %
Histopathology results		
Papilloma	23	20.35 %
Malignancy	4	3.53 %
Ectasia of duct	20	17.69 %

DISCUSSION

In the context of an escalating prevalence of breast cancer, accurate preoperative diagnosis emerges as a paramount consideration. A comprehensive diagnostic approach that amalgamates diagnostic imaging, fine-needle aspiration cytology (FNAC), and clinical assessments stands as the pinnacle for precise breast lesion diagnosis prior to surgical intervention.¹² This study acknowledges the spectrum of breast disorders, both benign and malignant, that may manifest as nipple discharge. Notably, individuals aged 39 years or older who present with spontaneous nipple discharge warrant thorough evaluation and potential excision.

The demographic distribution in this study, revealing the age groups of participants, sheds light on the distinct age-related patterns of nipple discharge. A significant proportion (46.01%) fell within the 26-35 years bracket, with 25.66% aged 36-45 years, and 20.35% aged 46-55 years. These findings correlate with prior research, such as a study encompassing 500 female patients conducted over 20 months, which identified the age range of 40-50 years as exhibiting the highest prevalence of nipple discharge.¹³

The manifestation of nipple discharge exhibited intriguing patterns in this study. Unilateral discharge was observed in 69.02% of cases, with bilateral discharge present in 30.98%. Furthermore, the distribution of spontaneous (18.58%) and non-spontaneous (81.41%) occurrences highlights the multifaceted nature of discharge characteristics. Intermittent discharge was more prevalent (84.04%) than persistent discharge (15.98%). The diversity of discharge colors, including bloody (23.98%), green (33.62%), and yellow (17.69%), underscores the varied clinical presentations encountered. Cytopathology reports demonstrated the prevalence of papillomas (20.35%) and the predominance of epithelial cells (60.01%), with a minority of cases exhibiting malignant cells (3.53%).

Comparisons with analogous studies yield illuminating insights. Clark SE et al reported a breast cancer prevalence of 4.4%, with variable positive predictive accuracies for mammography and ultrasonography in identifying malignancies.¹⁴ Thakur N et al explored a range of discharge colors and cytology results, highlighting the diverse cytological profiles.¹⁵ Another

study identified patterns of discharge incidence, including both-sided discharge (34%) and solitary discharge (66%), with the majority of lesions being benign (81%).¹⁶

Collectively, this study substantiates the intricate nature of nipple discharge patterns, their clinical implications, and the significance of a comprehensive diagnostic approach in guiding management decisions for this intriguing clinical concern.

CONCLUSION

In culmination, this study substantiates the efficacy of a three-pronged diagnostic approach encompassing clinical examination, radiological imaging, and cytological analysis of nipple discharge fluid. This strategy has demonstrated its ability to comprehensively evaluate patients presenting with nipple discharge, facilitating precise determination of the underlying etiology and guiding the formulation of tailored management strategies. Nevertheless, the pursuit of a more expansive multidisciplinary investigation, underpinned by a larger sample size and enhanced resource allocation, emerges as a logical trajectory. Such a comprehensive study holds the potential to provide a more definitive understanding of this intricate clinical condition, thereby refining the precision of evaluation and management approaches. Ultimately, this journey of continuous refinement will undoubtedly contribute to optimized patient care and outcomes in the realm of nipple discharge assessment and management.

Author's Contribution:

Concept & Design of Study: Mohammad Usman
 Drafting: Saif ur Rahman
 Data Analysis: Anwar Syed
 Revisiting Critically: Mohammad Usman, Saif ur Rahman
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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