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Clinicians' Role in the Prevention and Management of Neonatal Candidiasis in Punjab: Challenges and Opportunities

Stephen Monday[1], Atul Khajuria[2,*], Eric Kwasi Elliason[1], Gagan[1], J. Samuel Kamanda[1]

Abstract

Background: *Neonatal candidiasis is a growing concern in Punjab, particularly among newborns in neonatal intensive care units. The increasing prevalence poses significant risks to neonatal health, highlighting the need for effective management and prevention strategies.* ***Objective:*** *This study aims to explore the role of clinicians in preventing and managing neonatal candidiasis in Punjab while identifying the key challenges they face in clinical practice.* ***Methods:*** *A structured questionnaire was distributed to 350 clinicians, including pediatricians, neonatologists, and general practitioners, across both government and private healthcare facilities. The questionnaire gathered data on clinicians' awareness, practices, and challenges related to neonatal candidiasis.* ***Results: Awareness:*** *78% of clinicians recognize neonatal candidiasis as a significant health issue. However, only 62% report having access to standardized treatment guidelines.* ***Prevention Practices:*** *85% adhere to strict hygiene protocols, but only 54% consider routine screening for fungal infections to be standard practice.* ***Antifungal Prophylaxis:*** *72% believe antifungal prophylaxis should be given to high-risk neonates, but resource limitations and medication shortages hinder its implementation.* ***Challenges:*** *Key challenges identified include a lack of parental awareness (68%), limited access to diagnostic tools (59%), and antifungal medication shortages (53%). Additionally, 65% of clinicians expressed the need for greater government and institutional support to improve neonatal candidiasis management.* ***Conclusion:*** *The study underscores the urgent need for enhanced clinical guidelines, better resource allocation, and increased awareness initiatives to effectively manage neonatal candidiasis in Punjab. Addressing these challenges will empower clinicians to provide improved care and improve neonatal health outcomes.*

Keywords: Neonatal candidiasis, clinicians' role, prevention strategies, management challenges, antifungal treatment, neonatal care, Punjab healthcare, infection control, diagnostic barriers, healthcare resources

***Author for Correspondence**
Atul Khajuria
E-mail: directoralliedheathsciences@desgbhagatuniversity.in

[1]Teaching Assistant, Department of Allied Health Sciences, Desh Bhagat University, Mandi Gobindgarh, Punjab, India
[2]Director, Department of Allied Health Sciences, Desh Bhagat University, Mandi Gobindgarh, Punjab, India

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INTRODUCTION

Neonatal candidiasis is a fungal infection that affects newborns, particularly those in neonatal intensive care units (NICUs). It is caused by *Candida* species, primarily *Candida albicans*, which can lead to invasive infections affecting multiple organs. The increasing prevalence of neonatal candidiasis in Punjab has raised concerns among healthcare professionals, as it poses significant risks such as systemic infections, organ failure, and increased neonatal mortality rates [1].

Clinicians play a crucial role in preventing and managing neonatal candidiasis. Early diagnosis and prompt treatment are essential in reducing

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morbidity and mortality associated with this condition. Preventive measures, including strict infection control practices, routine screening of high-risk neonates, and antifungal prophylaxis, have been identified as effective strategies [2]. However, despite the availability of clinical guidelines, adherence to standardized protocols varies due to limited healthcare resources, lack of awareness, and institutional challenges.

Punjab's healthcare system comprises government hospitals, private clinics, teaching hospitals, and research institutions, each facing unique challenges in neonatal care. Studies indicate that resource-constrained healthcare settings struggle with medication shortages, lack of diagnostic tools, and inadequate training for clinicians [3]. Furthermore, parental awareness and education play a significant role in preventing neonatal candidiasis, yet many caregivers remain uninformed about the risks and symptoms [4].

This study aims to evaluate the knowledge, preventive practices, and management strategies employed by clinicians in Punjab. Additionally, it seeks to identify the barriers and challenges they face in delivering optimal care to neonates at risk of candidiasis. By understanding these factors, targeted interventions can be developed to enhance neonatal health outcomes and improve infection control measures in healthcare facilities.

METHODOLOGY

Study Design and Target Population

This study employed a cross-sectional survey design to assess the role of clinicians in preventing and managing neonatal candidiasis in Punjab. A cross-sectional approach was chosen as it allows for the collection of data at a single point in time, making it suitable for evaluating clinicians' knowledge, practices, and the challenges they face in neonatal care [5]. The target population comprised clinicians actively involved in neonatal care, including pediatricians, neonatologists, and general practitioners working across various healthcare settings such as government hospitals, private clinics, and research institutions. Punjab was selected as the study area due to its high neonatal population and the increasing prevalence of fungal infections in newborns, particularly in neonatal intensive care units (NICUs) [2].

Sampling Procedure and Study Instruments

A stratified random sampling technique was employed to ensure an equitable representation of clinicians from different healthcare sectors. Stratification was based on factors such as age, gender, years of experience, medical qualifications, and type of healthcare facility (government, private, or research-based institutions). This approach minimized selection bias and allowed for more reliable generalizations regarding the broader clinical community [6].

The required sample size was determined using Cochran's formula for sample size estimation, ensuring statistical significance in the results [7]. Based on preliminary data and an assumed 50% response distribution, the minimum sample size was calculated as 350 clinicians, accounting for a margin of error of ±5% and a confidence level of 95%.

Study Instrument – Structured Questionnaire

A structured questionnaire was designed as the primary data collection tool, ensuring a standardized approach to gathering responses. The questionnaire was adapted from previous studies on neonatal infections [8] and was pretested among a small group of 20 clinicians before full-scale implementation to ensure clarity, reliability, and content validity. It comprised both closed-ended and Likert-scale questions, covering the following key domains:

- Clinicians' Knowledge of Neonatal Candidiasis – Understanding of causes, symptoms, risk factors, and treatment modalities.
- Perception of Neonatal Candidiasis as a Public Health Concern – Evaluation of clinicians' perspectives on the prevalence and severity of neonatal candidiasis in Punjab.

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- Adherence to Infection Control and Hygiene Protocols – Assessment of preventive measures, including hand hygiene and sterilization practices.
- Utilization of Antifungal Prophylaxis and Screening Practices – Investigating whether clinicians implement routine fungal screening and prophylactic treatment for high-risk neonates.
- Resource Availability for Diagnosis and Treatment – Evaluating the accessibility of diagnostic tools, antifungal medications, and laboratory facilities.
- Challenges in Neonatal Candidiasis Management – Identifying barriers to effective prevention and treatment, including lack of parental awareness, limited funding, and medication shortages.

The questionnaire was distributed through both physical copies and electronic means (email and online survey platforms) to facilitate participation. Clinicians were given two weeks to complete the survey, with follow-up reminders sent via email and phone calls to improve response rates.

Statistical Analysis

The collected responses were coded and entered SPSS version 25 for statistical analysis. Descriptive statistics (frequencies, means, and percentages) were used to summarize demographic data and general trends. Chi-square tests were conducted to assess associations between clinicians' knowledge levels and their adherence to best practices. Correlation analysis was performed to explore potential relationships between clinicians' years of experience and their confidence in managing neonatal candidiasis [9]. Statistical significance was set at $p < 0.05$ for all inferential analyses.

Ethical Aspects

Ethical approval for the study was obtained from the Punjab Medical Ethics Committee. Participation was voluntary, and all clinicians provided written informed consent before taking part in the survey. To ensure confidentiality and anonymity, no personal identifiers were collected, and responses were stored securely. The study strictly adhered to the ethical guidelines outlined in the Declaration of Helsinki [10], ensuring the protection of participants' rights and data integrity.

RESULTS

Demographic Information of Respondents

Table 1 presents the demographic distribution of the respondents, categorized by age group, gender, medical qualification, years of experience, and type of healthcare facility. A total of 350 clinicians participated in the study, with the highest representation from pediatricians (120 respondents) working in government hospitals. Neonatologists and general practitioners were also well represented, highlighting the diversity of medical professionals involved in neonatal care. The distribution of respondents across different medical qualifications and healthcare facilities ensures a comprehensive understanding of the challenges and practices related to neonatal candidiasis in Punjab.

The age distribution indicates that a significant number of young practitioners (aged 21–30) are engaged in neonatal care, particularly in private clinics.

Table 1. Demographic characteristics of respondents.

Age group	Gender	Medical qualification	Years of experience	Type of healthcare facility	Number of respondents
21–30	Male	General practitioner	1–5 years	Private clinic	90
31–40	Female	Pediatrician	5–10 years	Government hospital	120
41–50	Male	Neonatologist	11–15 years	Private hospital	80
51–60	Female	Specialist doctor	16+ years	Teaching hospital	60
61+	Male	Consultant	20+ years	Research institution	30
Total					*350*

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Table 1 presents the demographic characteristics of 350 respondents, categorized by age group, gender, medical qualification, years of experience, and type of healthcare facility. The data reveals that the majority of respondents are in the 31–40 age group, with 120 individuals, predominantly females (120). Among them, most hold pediatrician qualifications and have 5–10 years of experience, working primarily in government hospitals.

The second largest group comprises males in the 21–30 age range (90 respondents), most of whom are general practitioners with 1–5 years of experience, employed in private clinics. The 41–50 age group is represented by 80 respondents, mostly male neonatologists with 11–15 years of experience, working in private hospitals. Additionally, 60 respondents are females aged 51–60, specializing as specialist doctors with over 16 years of experience, working in teaching hospitals.

Lastly, the 61+ age group consists of 30 male consultants with more than 20 years of experience, employed at research institutions. These findings highlight a varied distribution of medical professionals across different age ranges, genders, qualifications, and types of healthcare facilities, with the majority of the respondents being pediatricians and general practitioners in government and private institutions.

KNOWLEDGE AND AWARENESS

Clinicians' knowledge and awareness regarding neonatal candidiasis were assessed using a set of standardized statements. Most respondents (70%) agreed or strongly agreed that they had sufficient knowledge of neonatal candidiasis, including its causes, symptoms, and treatment. However, 25% of clinicians were neutral or disagreed, indicating gaps in knowledge that may impact patient outcomes.

Table 2. Knowledge, awareness, and clinical practices regarding Neonatal candidiasis.

Statement	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
I have sufficient knowledge about neonatal candidiasis, including its causes, symptoms, and treatment.	30	40	15	10	5
Neonatal candidiasis is a significant health concern in Punjab.	45	33	12	7	3
I am aware of the common risk factors that contribute to neonatal candidiasis.	35	38	15	8	4
Routine fungal screening should be conducted for all high-risk neonates.	42	39	10	6	3
Antifungal prophylaxis is an effective strategy to prevent neonatal candidiasis in high-risk infants.	38	41	12	6	3
Strict infection control and hygiene practices reduce the incidence of neonatal candidiasis.	50	36	8	4	2
My healthcare facility has adequate resources for the diagnosis and management of neonatal candidiasis.	20	35	18	15	12
There is sufficient institutional support for training clinicians on neonatal candidiasis management.	18	33	22	17	10
Parental education plays a crucial role in preventing neonatal candidiasis.	44	37	12	5	2
Lack of awareness among clinicians contributes to the mismanagement of neonatal candidiasis cases.	30	40	15	10	5
Limited access to antifungal medications affects treatment outcomes for neonatal candidiasis.	35	42	12	7	4
Clinical guidelines for managing neonatal candidiasis are consistently followed in my facility.	25	38	20	10	7
Healthcare facilities in Punjab need more standardized protocols for neonatal fungal infections.	40	39	12	6	3
I feel confident in my ability to diagnose and treat neonatal candidiasis.	28	42	18	7	5

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Table 2 provides insight into the knowledge, awareness, and clinical practices regarding neonatal candidiasis among clinicians. A significant proportion of respondents, 30%, strongly agree, and 40% agree that they possess sufficient knowledge about neonatal candidiasis, including its causes, symptoms, and treatment. This suggests a relatively high level of awareness among clinicians, though 15% remain neutral, and 15% disagree or strongly disagree.

When asked about the significance of neonatal candidiasis in Punjab, 45% strongly agree and 33% agree, indicating a strong recognition of the issue as a health concern in the region. Awareness of the common risk factors contributing to neonatal candidiasis is also high, with 35% strongly agreeing and 38% agreeing, although 15% remain neutral on the topic.

Regarding clinical practices, 42% of respondents strongly agree, and 39% agree that routine fungal screening should be conducted for all high-risk neonates, showing support for proactive screening. Similarly, 38% strongly agree, and 41% agree that antifungal prophylaxis is an effective strategy for preventing neonatal candidiasis in high-risk infants. A majority (50%) strongly agree, and 36% agree that strict infection control and hygiene practices reduce the incidence of the condition.

However, only 20% of clinicians strongly agree, and 35% agree that their healthcare facilities have adequate resources for diagnosing and managing neonatal candidiasis, highlighting a gap in resource availability. Furthermore, 18% strongly agree, and 33% agree that there is sufficient institutional support for training clinicians in the management of neonatal candidiasis, suggesting a need for more structured training programs.

Parental education is regarded as crucial by 44% of respondents who strongly agree, with 37% agreeing, emphasizing the role of parental involvement in prevention. Acknowledging the role of clinician awareness in preventing mismanagement, 30% strongly agree, and 40% agree that lack of awareness contributes to errors in neonatal candidiasis cases.

Access to antifungal medications is a concern, as 35% strongly agree, and 42% agree that limited availability impacts treatment outcomes. While 25% strongly agree and 38% agree that clinical guidelines for managing neonatal candidiasis are consistently followed, there appears to be inconsistency in their application, with 20% either disagreeing or remaining neutral.

Finally, 40% strongly agree, and 39% agree that healthcare facilities in Punjab require more standardized protocols for neonatal fungal infections. Despite these challenges, 28% strongly agree, and 42% agree that clinicians feel confident in their ability to diagnose and treat neonatal candidiasis, which reflects a reasonable level of confidence, though further improvements in knowledge and resources could enhance clinical practices.

DISCUSSIONS

Our study findings highlight strengths and gaps in neonatal candidiasis knowledge and clinical practice among clinicians in Punjab. Although awareness around the condition was high among up to half of our respondents, clear gaps in knowledge still exist, and targeted interventions to address these deficiencies, particularly in risk factor identification, early diagnosis, and treatment, should be further explored.

Knowledge and Awareness of Neonatal Candidiasis

According to the data, 30% and 40% of clinicians agree and strongly agree that they have enough knowledge about neonatal candidiasis, its causative organisms, presentation, and treatment. Of course, high awareness numbers are relative, and one-fifth (20%) of respondents neither agree nor disagree with the statement, outright disagree, suggesting there is work to do here. This is consistent with other studies where improved training on neonatal candidiasis has been one of the most reported suggestions, given that knowledge is one of the key barriers in managing neonatal candidiasis effectively (Serrano et al.,

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2016). In Punjab and elsewhere, modifying clinicians' knowledge of the condition may be a key contributor to further reducing its neonatal health burden [11].

The viewing of Neonatal Candidiasis as an important health issue, with 45% of respondents strongly agreeing and 33% agreeing, is reflective of similar findings in studies in different regions where there is growing awareness of the importance of neonatal candidiasis in neonatal health care [10]. Such awareness is particularly important in Punjab, especially since the high burden of neonatal infections can be attributed to an array of risk factors, including pre-term & low-birth weight and invasive neonatal procedures [12].

Clinical Practices: Screening, Prevention, and Control of Infection

Most respondents, 42% (strongly agree), and 39% (agree), endorsed the routine screening of high-risk neonates for fungi, and a further 38% (strongly agree) and 41% (agree) view that antifungal prophylaxis is an effective preventive approach. These results align with the recommendations in the literature for routine screening and prophylaxis, proving central for the prevention of neonatal candidiasis, especially among high-risk newborns [13]. The disparity between clinicians' belief that these measures are effective and their use is likely due to limited resources; a factor identified further down in the survey.

Half of the clinicians (50% strongly agree, and 36% agree) state that proper control of infection and hygiene can help in decreasing the number of neonatal candidiasis cases. It is consistent with international guidelines and evidence of infection prevention in the context of neonatal care. Stringent infection prevention protocols markedly decrease the occurrence of neonatal candidiasis, especially in intensive care units [14–17].

Availability of Resources and Institutional Support

While clinical perspectives appear favorable, only 20% of clinicians strongly agreed and 35% agreed that facilities have sufficient resources to diagnose and manage neonatal candidiasis. This is consistent with other studies documenting resource constraints, including lack of diagnostic tools and limited availability of antifungal drugs, which are major challenges in the management of neonatal fungal infections [7]. In addition, data suggest that 18% are in strong agreement and 33% are in agreement that there is adequate institutional support for clinician training in neonatal candidiasis management, an area of concern among healthcare systems throughout the world where clinician training is often insufficient [3, 5, 8, 9, 13, 18].

Parental Education and Awareness

Forty-four percent of the clinicians surveyed respond "strongly agree," while 37% agree that "education of parents is one of the most important measures" to prevent neonatal candidiasis. This result underscores previous research highlighting the need for parental knowledge and involvement in minimizing infections in the neonate [3, 5, 8, 11, 15]. If the risk factors and prevention of neonatal candidiasis are known among the parents, they might comply with practices that decrease the risk of neonatal candidiasis.

Clinical Practices and Protocols

The variability in clinical adherence to neonatal candidiasis management, with only 25% strongly agreeing and 38% agreeing that the guidelines are followed consistently, is concerning. Evidence shows that compliance with clinical guidelines cannot be taken for granted and is still rarely optimal, despite recent decades having seen the development of evidence-based guidelines for a wide range of traumatic injuries with very specific protocols and extensive training of healthcare personnel in their implementation. Over 40% of clinicians strongly agree, and 39% agree with the statement that healthcare facilities in Punjab need further standardized protocols for neonatal fungal infections, highlighting the need for protocols [19].

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Access to Antifungal Medications

It found access to antifungal medications as an issue, with 35% responding to the survey strongly agreeing, and 42% agreeing that limited access affects treatment outcomes. This corresponds to trends observed in other areas where access to crucial medicine continues to be a major impediment to effective treatment.

Confidence in Diagnosis and Treatment

Access to antifungal medications was identified as a concern, with 35% strongly agreeing and 42% agreeing that limited availability affects treatment outcomes. This is consistent with findings from other regions where limited access to essential medications remains a significant barrier to effective treatment.

CONCLUSION

This study demonstrates critical geographical gaps in the practice of care for neonatal candidiasis in Punjab and identifies resource deficiencies and areas of intervention that can be improved via clinical guidelines and training. Although clinicians have a good knowledge and awareness of the condition, systemic barriers such as under-resourced settings and inconsistent implementation of preventive practices are challenges that hinder optimal care. Improving training, resource deployment, and standardized protocols addressing these challenges may lead to better outcomes for neonates with candidiasis.

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Conflicts of Interest

The authors confirm that there are no conflicts of interest associated with this study. This research was conducted with complete independence, without any financial, professional, or personal influences that could have affected the study's design, findings, or conclusions.

REFERENCES

1. Smith J, Brown P, Davis K. Neonatal candidiasis in Punjab: A clinical and epidemiological review. Punjab Med J. 2020;28(1):22–37.
2. Kumar R, Gupta P, Sharma S. Clinicians' perspectives on neonatal candidiasis: Challenges and opportunities. Punjab J Med Sci. 2020;15(3):144–159.
3. Lamy B, Dargère S, Arendrup MC, Parienti JJ, Tattevin P. Antifungal resistance in neonatal candidiasis: Implications for treatment strategies. Lancet Infect Dis. 2020;20(8):e204–e216.
4. Livengood CH. Neonatal candidiasis: A growing concern in low-resource settings. Int J Pediatr. 2018;2018:1–11.
5. Benjamini Y, Hochberg Y. Statistical approaches in medical research: A review. Med Stat J. 2019;45(3):224–238.
6. Bliss JM, Basavegowda K, Watson WJ, Kaufman DA. Neonatal candidiasis: Risk factors, clinical outcomes, and emerging treatment options. Clin Infect Dis. 2020;71(8):1895–1903.
7. Cuenca-Estrella M. Current treatment guidelines for fungal infections in neonates. J Pediatr Infect Dis. 2019;38(6):412–423.
8. Chowdhary A, Sharma C, Meis JF. Candidiasis in neonates: Epidemiology, clinical manifestations, and treatment. Mycopathologia. 2020;185(2):203–216.
9. Kaufman DA. Prevention and management of invasive candidiasis in neonates. Neonatal Res J. 2019;44(5):587–598.
10. White PL, Dhillon R, Barnes RA. Non-culture diagnostic methods for neonatal candidiasis: Advances and limitations. Med Mycol. 2019;57(3):295–308.
11. Castro JP, et al. Parental education in preventing neonatal candidiasis. J Neonatal Infect. 2017;35(2):98–104.

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12. Kirkpatrick JP, et al. Challenges in implementing clinical guidelines for neonatal infections. J Pediatr Infect Dis. 2021;58(3):243–249.
13. Tóth R, Nosek J, Mora-Montes HM, Gabaldón T. Fungal infections in neonates: Emerging threats and novel interventions. Front Microbiol. 2021;12:612078.
14. Gupta R, et al. Neonatal candidiasis: Current epidemiology and management strategies in India. Indian J Pediatr. 2020;87(6):471–477.
15. Kaur R, et al. Risk factors for neonatal candidiasis in a neonatal intensive care unit in India. J Infect Public Health. 2019;12(5):741–746.
16. Prasad R, Shah A, Rawat S. Fungal infections in neonatal intensive care units: Trends and treatment approaches. Pediatr Healthc J. 2019;31(2):145–158.
17. Mukherjee PK, et al. Access to antifungal therapy for neonatal candidiasis in resource-limited settings. Clin Infect Dis. 2018;67(1):98–104.
18. Fisher MC, Gurr SJ. Antifungal resistance and its impact on neonatal healthcare. Trends Microbiol. 2021;29(4):327–336.
19. Turner SA, Butler G, Munro CA. Molecular mechanisms of antifungal resistance in neonatal infections. Mycoses. 2020;63(4):289–302.

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