

A STUDY OF FUNGAL COLONIZATION IN NEWBORN

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ABSTRACT:

Research Problem: What are the factors responsible for fungal colonization in newborns?

Objective: To study the pattern of and predisposing factors for the development of superficial candidiasis and fungal colonization in the newborns.

Study Design: Prospective study.

Setting: Neonatology unit of the Paediatrics department of a teaching hospital.

Participants: Randomly selected pregnant mothers admitted to the maternity ward and the newborns delivered to them.

Sample Size: 120 pregnant mothers and the newborns delivered.

Study Variables: Candida, Site of colonization.

Statistical Analysis: By tests of significance

Results: Candida was isolated from 23 (19.16%) infants on the first day increasing to 52 (43.33%) infants on the sixth day. The most common site of colonization was oral cavity. Candida colonization was more common in premature infants ($p < 0.05$). Oral thrush was seen in 29 (24.17%) infants during the study and a significant number of these infants showed colonization from the first day of life.

Conclusions: Fungal colonization of the newborns due to Candida species is quite common, and in the first week of life predominantly occurred in the oral cavity. Superficial clinical candidiasis, especially oral thrush is more common in those colonized on the first day of life.

Key Words: Newborns, Fungal colonization, Superficial candidiasis.

INTRODUCTION:

Neonatal infections with unusual organisms especially Candida is an increasing problem in the neonatal intensive care units and presents new challenges to the neonatologist and microbiologist. Although oral thrush is the commonest clinical manifestation of candidal disease in neo-

nates, the importance of Candida as the causative organism of late onset systemic infection in the premature infant is also being increasingly recognized¹. Neonates may acquire Candida soon after birth and this colonisation increases with age in the neonatal period². The present study was undertaken to determine the pattern of superficial neonatal candidiasis and fungal colonization in the newborns.

MATERIAL AND METHODS:

One hundred and twenty mothers admitted to this hospital between October 1988 & June 1989 for delivery and the babies born to them were randomly selected for this study. A detailed clinical history was obtained from the mothers and a vaginal swab was taken for fungus culture. Swabs were collected from the newborns on the first and the sixth day from oral cavity, rectum and the skin of axilla and groin. Infants were observed daily for the appearance of oral thrush and / or cutaneous, candidiasis. The isolation and the identification of the fungus was done using standard techniques³. Sabouraud's dextrose agar plates were also exposed to the nursery air to detect the presence of fungi in the environment of the neonatology unit.

RESULTS:

Results of the study show that vaginal culture was positive in 46(38.33%) mothers. A significant number of babies born via vaginal route to mothers with vaginal candidiasis (group Ia) showed fungal colonization when compared to the babies in other groups (Table - I). The rate of colonization increased from 19% on the first day to 43% on the sixth day. Oral cavity was the most common site of colonization (Table - II). Prematu-

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rity was found to be significantly associated with fungal colonization (Table - III).

Oral thrush was observed in 29(24.17%) infants during the course of the study. A significant number (73.4%) of these infants showed colonization from the first day of life. Prematurity was not found to be a predisposing factor for the development of oral thrush.

Candida albicans was the most commonly isolated species (84.62%). Other species isolated were *C. tropicalis*, *C. stellatoidea*, and *C. pseudotropicalis*.

We failed to isolate *Candida* from the environment of the nursery even after repeated exposure of the petri dishes.

DISCUSSION:

Colonization of the newborn by fungi especially *Candida* species is an increasing problem and was found to be predominantly associated with maternal vaginal candidiasis. Colonization was highest among infants delivered through normal vaginal route of mothers with vaginal candidiasis. These findings are consistent with earlier studies^{4,5}.

Among the risk factors associated with colonization, prematurity correlated significantly while other factors like prolonged rupture of membranes and Apgar score at 5 minutes had no significant relationship with fungal colonization. Prematurity as a predisposing factor for colonization has been observed in other studies also^{6,7}.

Candida was isolated from 19% infants on the first day increasing to 43% infants on the sixth day. These rates of colonization are comparable to those reported by Uma et al.⁵. Russell and Lay², however, have reported somewhat lower rates of oral colonization in term infants, but they have not studied colonization at other sites.

Oral thrush was observed in 24% infants during the course of our study. There has been a considerable variation in the incidence of oral thrush reported by various authors^{4,6,8,9}. This variation may be due to factors such as the prevalence and the adequacy of treatment of *Candida* vulvo-vaginitis in mothers and the duration of

stay of the babies in the hospital.

We failed to isolate *Candida* from the nursery air even after multiple exposures of media plates. Our observations and the results of many other studies^{5,8,10} indicate that airborne *Candida* does not seem to play any important role in the transmission of infection.

The following conclusions can be drawn from the present study:-

1. Fungal colonization of the newborn due to *Candida* sp. is quite common. *Candida* can be isolated from the newborn as early as the first day of life.
2. Fungal colonization is more common in premature infants and those delivered by normal vaginal route to mothers having vaginal candidiasis.
3. Majority of infants who had *Candida* colonization on the first day, later on developed oral thrush.
4. Fungal colonization in the first week of life predominantly occurred in the oral cavity and gastrointestinal tract.

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TABLE - I: FUNGAL COLONIZATION IN INFANTS ON THE FIRST AND THE SIXTH DAY

| Group | No. of babies n = 120 | Fungal Colonization | |
|---|--------------------------|---------------------|------------|
| | | First day | Sixth day |
| I. Babies delivered normally | | | |
| a. To mothers with vaginal candidiasis | 37 | 18(48.64) | 30(81.08)* |
| b. To mother without vaginal candidiasis | 53 | 05(09.43) | 16(30.18) |
| II. Babies delivered by caesarian section | | | |
| a. To mothers with vaginal candidiasis | 09 | 0 | 02(22.22) |
| b. To mothers without vaginal candidiasis | 21 | 0 | 04(19.04) |

* z = 3.38, p<0.05

Figures in parentheses are percentages.

TABLE - II: ISOLATION OF CANDIDA IN RELATION TO THE SITE

| Day of Isolation | No. of infants with colonization | Oral cavity | Isolation of Candida (in percent) | | |
|------------------|----------------------------------|-------------|-----------------------------------|-------|--------|
| | | | Axilla | Groin | Rectum |
| First day | 23(19.16%) | 86.9 | 69.56 | 69.56 | 78.26 |
| Sixth day | 52(43.33%) | 88.4 | 46.15 | 50.00 | 84.61 |

TABLE - III: CORRELATION OF COLONIZATION WITH VARIOUS DEMOGRAPHIC FACTOS

| | Colonization | | p value |
|----------------------------|--------------|-----------------|---------|
| | Infants with | Infants without | |
| Number | 52(43.33) | 68(56.67) | |
| Gestational Age | | | |
| Preterm | 17(32.69) | 11(16.18) | <0.05 |
| Term | 35(67.31) | 57(83.82) | |
| Type of delivery | | | |
| Vaginal | 46(88.46) | 44(63.24) | <0.01 |
| LSCS | 06(11.54) | 24(36.76) | |
| Ruptured membranes | | | |
| <12 hours | 36(69.23) | 46(67.64) | N.S. |
| >12 hours | 12(23.07) | 17(25.00) | |
| Apgar Score (5 min) | | | |
| <5 | 04(07.69) | 06(08.82) | N.S. |
| >5 | 48(92.31) | 62(91.18) | |

Figures in parentheses are percentages
N. S.: not significant

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