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An assessment of heel blood sampling procedures for postnatal screening in newborn infants at the national hospital of obstetrics and gynecology in Vietnam, 2023

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Abstract---The study was conducted over one month in the Obstetrics Department at the Central Maternity Hospital. The objective was to depict the current state of knowledge among mothers regarding the heel blood sampling program for postnatal screening and to analyze the decision-making process of mothers in implementing postnatal screening for their infants. Method: A cross-sectional descriptive method was employed in this study. The results revealed that 40% of mothers were unaware of the heel blood sampling program. Age and location were identified as factors influencing this lack of awareness. Despite good maternal knowledge about heel blood sampling at the Obstetrics Department, only 78.4% of mothers decided to proceed with heel blood sampling for their infants. The conclusion drawn emphasizes the need to strengthen counseling efforts to increase the rate of infants undergoing heel blood sampling for postnatal screening.

Keywords---Postnatal Screening, Heel Blood Sampling, Maternal Knowledge.

1. Introduction

The Newborn Screening Program (NBS) has been a practical measure since 1998 to reduce the incidence of diseases and disabilities in infants, thus contributing to the overall improvement of population health. Although heel blood sampling is a relatively simple procedure, it plays a crucial role in diagnosing three congenital

diseases in newborns. These include G6PD deficiency, congenital hypothyroidism, and congenital adrenal hyperplasia, causing disorders in galactose metabolism, fatty acids, and amino acids. Early detection of these conditions enables timely intervention and ensures a normal life for affected infants. It is essential to collect blood samples within 1-7 days after birth. While the target beneficiaries of this program are newborns, the primary decision-makers are their mothers. Lack of understanding among mothers about the heel blood sampling program for postnatal screening becomes a significant factor leading to the decision against undergoing this crucial test.

2. Research Objectives and Methods

The study was conducted on all mothers in the Obstetrics Department at Ward 2 of the Central Maternity Hospital from February 15, 2023, to March 15, 2023. Mothers were counseled about heel blood sampling for postnatal screening within 12 hours of being transferred to Ward 2 from the delivery room or operating room. Subsequently, near the time when infants were to undergo blood testing, midwives at the department conducted interviews using a pre-existing set of questions. During this period, 395 mothers were interviewed.

3. Research Results

3.1. The Current Situation of Maternal Access to Information About Heel Blood Sampling for Postnatal Screening

Table 1: Maternal Access to Information About Postnatal Screening Program Before Birth

| Awareness of the Postnatal Screening Program | Number | Percentage |
|--|--------|------------|
| Yes | 169 | 42.80% |
| No | 226 | 57.20% |
| Total | 395 | 100% |

This table provides insights into the awareness of mothers regarding the postnatal screening program before giving birth. Out of the 395 surveyed mothers, 169 (42.8%) were informed about the postnatal screening program, while 226 (57.2%) were not aware of it.

3.2. Maternal Knowledge on the Neonatal Heel Blood Sampling Screening Program

In this section, we delve into the understanding of mothers regarding the neonatal heel blood sampling screening program. The following table (Table 2) outlines the situation of maternal consultation on this screening method after giving birth.

Table 2: Maternal Knowledge About the Postnatal Heel Blood Sampling Screening Program

| Consultation about Heel Blood Sampling Screening Program After Birth | Number | Percentage |
|--|--------|------------|
| Advised after this delivery | 395 | 100% |
| Not advised | 0 | 0% |
| Total | 395 | 100% |

The table illustrates that all 395 surveyed mothers were advised about the heel blood sampling screening program after giving birth, indicating a comprehensive coverage of postnatal consultation in this regard.

Table 3: Knowledge about the Purpose of Neonatal Heel Blood Sampling for Newborn Screening

| Knowledge about the Purpose of Neonatal Heel Blood Sampling Screening | Number | Percentage |
|---|--------|------------|
| Understanding the purpose of neonatal heel blood sampling screening | | |
| Not aware | 200 | 50.60% |
| Aware (Correct understanding) | 160 | 40.50% |
| Aware (Incorrect understanding) | 35 | 8.90% |
| Total | 395 | 100% |

Table 3 provides insights into the maternal understanding of the purpose behind neonatal heel blood sampling for newborn screening. The data indicates that 50.6% of mothers were not aware of the purpose, while 40.5% had a correct understanding, and 8.9% had an incorrect understanding. This information sheds light on the varying levels of awareness and comprehension among the participants.

Table 4: Knowledge about Diseases Screened through Neonatal Heel Blood Sampling in Vietnam

| Knowledge about Diseases Screened through Neonatal Heel Blood Sampling | Number | Percentage |
|--|--------|------------|
| Awareness of diseases screened through neonatal heel blood sampling | | |
| Not aware/knowledge is insufficient | 200 | 50.60% |
| Aware and fully knowledgeable | 148 | 37.50% |
| Aware but not fully knowledgeable | 47 | 11.90% |
| Total | 395 | 100% |

Table 4 outlines the maternal knowledge regarding the diseases screened through neonatal heel blood sampling in Vietnam. The data reveals that 50.6% of mothers were either not aware or had insufficient knowledge about the diseases. On the other hand, 37.5% were fully knowledgeable, and 11.9% had partial knowledge about the diseases screened. This information emphasizes the need for comprehensive education and awareness programs among mothers regarding the diseases covered by neonatal screening.

Table 5: Knowledge about the Treatability of Diseases Detected through Screening Program

| Knowledge about Treatability of Diseases Detected | Number | Percentage |
|---|--------|------------|
| Awareness of treatability of diseases | | |
| Correct | 262 | 66.30% |
| Incorrect | 133 | 33.70% |
| Total | 395 | 100% |

Table 5 illustrates the maternal awareness regarding the treatability of diseases detected through the screening program. The data indicates that 66.3% of mothers had correct knowledge about the treatability of these diseases, while 33.7% held incorrect beliefs. This highlights the importance of enhancing education and communication to ensure accurate information about the potential treatment options available for the detected diseases.

Table 6: Knowledge about the Timing of Heel Blood Collection

| Knowledge about Timing of Heel Blood Collection | Number | Percentage |
|---|--------|------------|
| Awareness of the correct timing | | |
| Correct | 246 | 62.30% |
| Incorrect/Not Aware | 149 | 37.70% |
| Total | 395 | 100% |

Table 6 presents data on maternal knowledge about the appropriate timing for heel blood collection. The results show that 62.3% of mothers were aware of the correct timing, while 37.7% either provided incorrect information or were not aware of the optimal timing. This underscores the importance of education and clarification regarding the appropriate timeframe for heel blood collection in the screening process.

3.3. Maternal Attitudes and Practices Regarding Heel Blood Collection for Newborn Screening

Table 7: Maternal Attitudes Toward Heel Blood Collection for Newborn Screening

| Attitude | Number | Percentage |
|-----------------------------|--------|------------|
| Perceives it as necessary | 310 | 78.40% |
| Perceives it as unnecessary | 85 | 21.50% |
| Total | 395 | 100% |

Table 7 illustrates the attitudes of mothers toward the procedure of heel blood collection for newborn screening. The majority, comprising 78.4%, perceive this procedure as necessary, while 21.5% consider it unnecessary.

Table 8: Maternal Decisions Regarding Heel Blood Collection for Newborn Screening After Birth

| Decision | Number | Percentage |
|---|--------|------------|
| Chooses to have the child undergo blood testing | 286 | 72.40% |
| Chooses not to have the child undergo blood testing | 109 | 27.60% |
| Total | 395 | 100% |

Table 8 provides an overview of maternal decisions regarding whether to have their child undergo heel blood collection for newborn screening after birth. The results show that 72.4% of mothers decide to have their child undergo the blood test, while 27.6% choose not to.

Table 9: Maternal Decisions Regarding Heel Blood Collection for Newborn Screening After Previous Births (mothers with two or more children)

| Decision | Number | Percentage |
|---|--------|------------|
| Chooses to have the child undergo blood testing | 5 | 7.20% |
| Chooses not to have the child undergo blood testing | 64 | 92.80% |
| Total | 69 | 100% |

Table 9 presents maternal decisions regarding heel blood collection for newborn screening after previous births for mothers with two or more children. The data indicate that 7.2% of mothers choose to have their child undergo the blood test, while 92.8% opt not to.

4. Discussion

4.1 Maternal Knowledge Regarding Heel Blood Collection for Newborn Screening

After childbirth, we observed that 100% of mothers were counseled about heel blood collection for newborn screening (Table 2), whereas only 42.8% had information about the program before giving birth (Table 1). This indicates that the healthcare staff at Obstetrics Department 2 has been actively engaged in counseling mothers.

Despite the 100% counseling rate, maternal knowledge about the program is not comprehensive. Only 40.5% of mothers correctly understood the purpose of the heel blood test, 37% knew all three groups of diseases screened through heel blood collection, and 11.9% were aware of at least one of the three groups. Additionally, 33.7% of mothers were informed about the potential treatability of the screened diseases if detected early, and 62.3% knew the correct timing for heel blood collection in infants. Thus, even with counseling, 37.7% of mothers lacked basic information about heel blood collection for newborn screening. This might be attributed to the postpartum counseling period, where mothers are fatigued and focused on newborn care, resulting in limited attention to surrounding information. Therefore, we suggest reinforcing counseling efforts both before and after childbirth to ensure that mothers have a clear understanding of the information, facilitating informed decisions for their infants.

4.2 Maternal Attitudes and Practices Regarding Heel Blood Collection for Newborn Screening

The study revealed that after counseling at Obstetrics Department 2, 78.4% of mothers considered the program necessary, and 72.4% decided to have their child undergo heel blood collection for newborn screening (Tables 7 and 8). Despite limited knowledge, many mothers based their decisions on the perceived necessity of the test for their child. In interviews with mothers who had given birth more than once, only 7.2% had decided to have their child undergo heel blood collection in the previous birth. This indicates that counseling at Obstetrics Department 2 positively influences maternal decisions. Combining counseling both before and after childbirth is likely to further enhance the rate of mothers opting for the blood test.

5. Conclusion

Maternal knowledge about the heel blood collection program for newborn screening is still limited. While 40.5% of mothers correctly understand the purpose of the test, and 72.4% decide to have their child undergo the blood test, there is room for improvement in the mothers' understanding of the basic information regarding the program. It is crucial to strengthen counseling efforts on newborn screening both before and after childbirth, and further research is needed to understand why some mothers are hesitant to have their child undergo newborn screening.

References

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