

<https://doi.org/10.48047/AFJBS.6.15.2024.8776-8782>



African Journal of Biological Sciences

Journal homepage: <http://www.afjbs.com>



Research Paper

Open Access

AUDIT OF ADMINISTRATION OF INJECTION VITAMIN K TO NEWBORNS AT BIRTH IN LABOUR ROOM

1. Dr Komal Mannan (Corresponding Author), 2. Dr Sana Sattar, 3. Dr Farah Niaz Awan

03354210000 drkomalmannan@gmail.com

Consultant Gynaecologist THQ Hospital Ferozwala

Consultant Gynaecologist THQ Hospital Ferozwala

sanasattar7700@gmail.com 03012557207

roshniali22@yahoo.com

Women Medical Officer THQ Hospital Ferozwala 03366038706

Volume 6, Issue 15, Sep 2024

Received: 15 July 2024

Accepted: 25 Aug 2024

Published: 05 Sep 2024

doi: [10.48047/AFJBS.6.15.2024.8776-8782](https://doi.org/10.48047/AFJBS.6.15.2024.8776-8782)

Abstract

Background:

Vitamin K is crucial for preventing hemorrhagic disease in newborns, yet discrepancies in its administration can compromise newborn health. Previous studies show varying compliance with recommended protocols across healthcare settings.

Objective:

To evaluate compliance with vitamin K administration guidelines in a regional hospital, identify shortcomings, and assess the impact of targeted interventions on practice improvement.

Methods:

A retrospective audit was conducted at Tehsil headquarter hospital Ferozewala, examining records from January to February 2024, followed by a re-audit in August 2024. Compliance with vitamin K administration within six hours of birth, documentation accuracy, and adherence to consent processes were assessed.

Results:

The initial audit revealed that 80% of newborns received vitamin K, with only 73% administered within the recommended timeframe. Post-intervention, compliance improved to 96% for administration and 98% for timing. Documentation and consent practices reached 100% compliance in the re-audit.

Conclusion:

Targeted interventions significantly enhanced compliance with vitamin K administration protocols. Continuous auditing and training are essential for sustaining these improvements and ensuring the safety and well-being of newborns.

Keywords:

Audit, Compliance, Neonatal Care, Newborn, Vitamin K, Quality Improvement, Retrospective Analysis

Introduction

Vitamin K, a crucial nutrient essential for blood clotting, plays a pivotal role in preventing hemorrhagic disease of the newborn, also known as vitamin K deficiency bleeding (VKDB). This condition, which can manifest in the early days of life, poses a significant threat to newborns due to their naturally low levels of vitamin K(1). Both the American Academy of Pediatrics and the World Health Organization recommend the administration of a single dose of vitamin K by intramuscular injection to all newborns shortly after birth as a prophylactic measure. Despite these clear guidelines, variations in compliance and practice persist across different healthcare settings, often leading to suboptimal care and preventable risks(2, 3).

Recent evaluations of newborn care practices in various regions have revealed a concerning inconsistency in the administration of vitamin K, with discrepancies in both the timing of the injection and adherence to protocols(4). These gaps in practice not only heighten the risk of VKDB but also reflect broader issues in the management and implementation of newborn care protocols. Prompted by these findings, a focused audit was initiated at Tehsil headquarter hospital Ferozewala. The primary aim was to scrutinize the adherence to the recommended guidelines for vitamin K administration among the newborns cared for in their labor room(5, 6).

The initial audit, carried out from January to February 2024, aimed to gather baseline data on several critical metrics: whether vitamin K was administered, the timing of its administration, proper documentation in medical records, obtaining informed maternal consent, and the qualification of the personnel administering the injection(7). The results uncovered several shortcomings. Only 80% of newborns received vitamin K, and even fewer received it within the recommended six-hour window post-birth. Documentation was often incomplete, and the process for obtaining maternal consent was inconsistently followed, which suggested a lack of awareness and training among the staff(8, 9).

These initial findings spurred a series of recommendations aimed at bridging the identified gaps. These included ensuring a consistent supply of vitamin K in the hospital pharmacy, standardized documentation procedures, mandatory staff training on the importance of timely administration, and protocols to secure informed consent. Subsequently, a re-audit was conducted in August 2024 to assess the impact of the interventions and to ensure that improvements were sustained. This re-audit demonstrated a marked enhancement in practice, with compliance rates nearing 100% across all evaluated criteria(9).

The objective of this rigorous audit and subsequent re-audit was not only to rectify the immediate deficiencies but also to catalyze a long-term commitment to adherence to best practices in newborn care. By documenting both the process and outcomes of these audits, this report aims to contribute to the broader dialogue on newborn health and to underscore the critical importance of systemic, evidence-based improvements in hospital practices concerning the administration of vitamin K. Such endeavors are vital in ensuring that all newborns receive the best start in life, free from the preventable risks of vitamin K deficiency bleeding(10).

Methods

The audit was conducted at Tehsil headquarter hospital Ferozewala, a regional healthcare facility equipped with a dedicated labor room where all live births during the study period were attended to. This setting was chosen due to its typical representation of regional hospital practices and the volume of births handled, providing a robust framework for evaluating the standard of care in vitamin K administration to newborns(11).

The criteria for the audit were clearly defined to align with the recommendations of the Centers for Disease Control and Prevention (CDC). The standard set forth for the audit stipulated that all newborns, regardless of whether they were breastfed or formula-fed, should receive a one-time intramuscular shot of vitamin K within six hours of birth. The goal was set at 100% compliance, reflecting the national standard for vitamin K administration in newborns(12).

Data collection for this audit was planned and executed through a retrospective review of medical records. Each live birth recorded in the hospital during the specified periods of January to February 2024 and subsequently in August 2024 for the re-audit, was included in the study. The data collected included the timing of the vitamin K injection, the documentation of the dosage and administration details in the patient's file, the procurement of maternal consent, and the verification of the healthcare professional's credentials who administered the vitamin K shot. This comprehensive data gathering was conducted manually using a standardized proforma, which was later digitized and analyzed using Microsoft Excel(12).

For the statistical analysis, simple percentage comparisons were utilized to assess the adherence to the set standards. The initial audit findings were then compared with the results from the re-audit to measure improvements and the effectiveness of the interventions implemented between the two audit periods. This analysis not only highlighted the areas of success but also underscored the persistent gaps that required ongoing attention to ensure sustained compliance with the recommended practices(13).

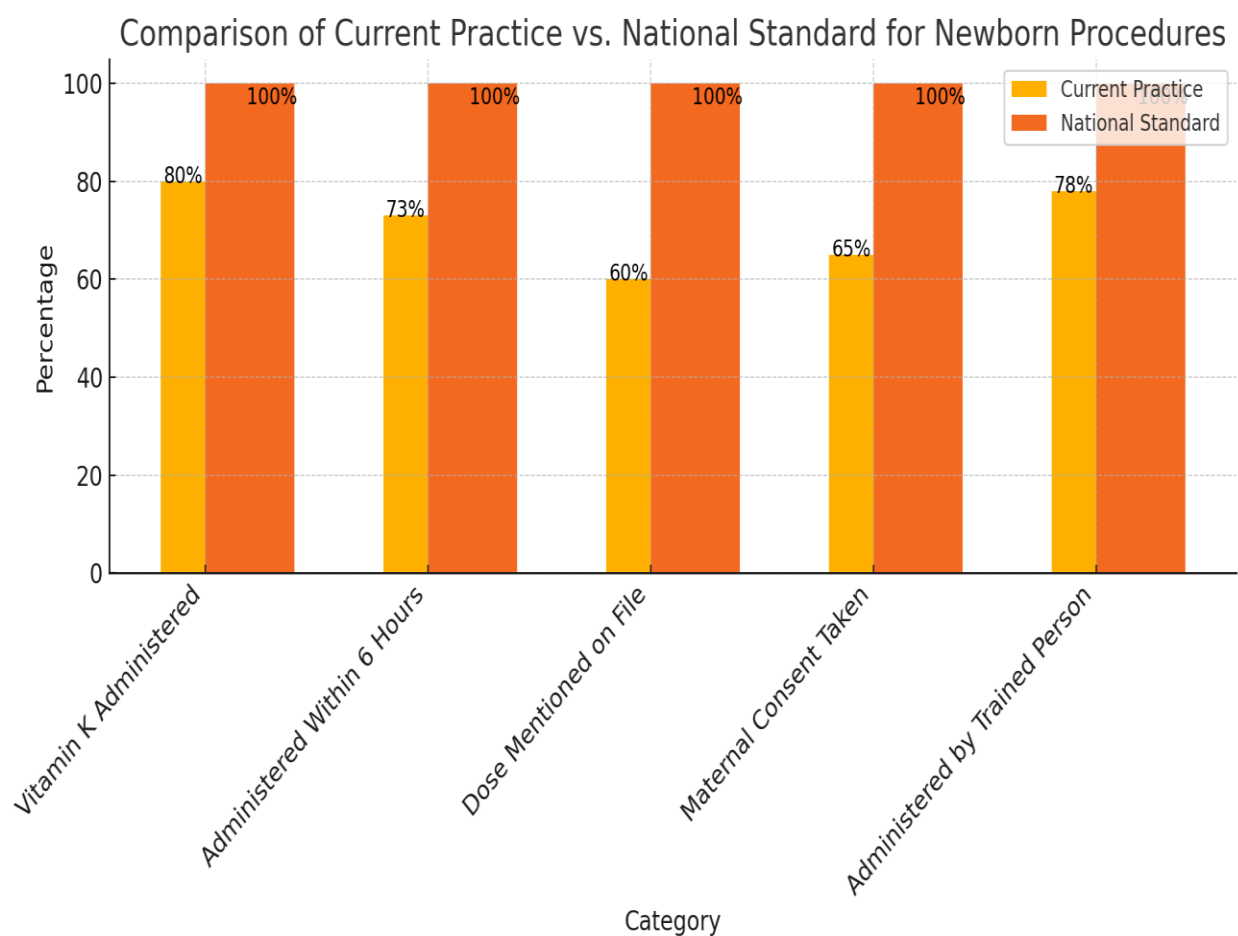
Results

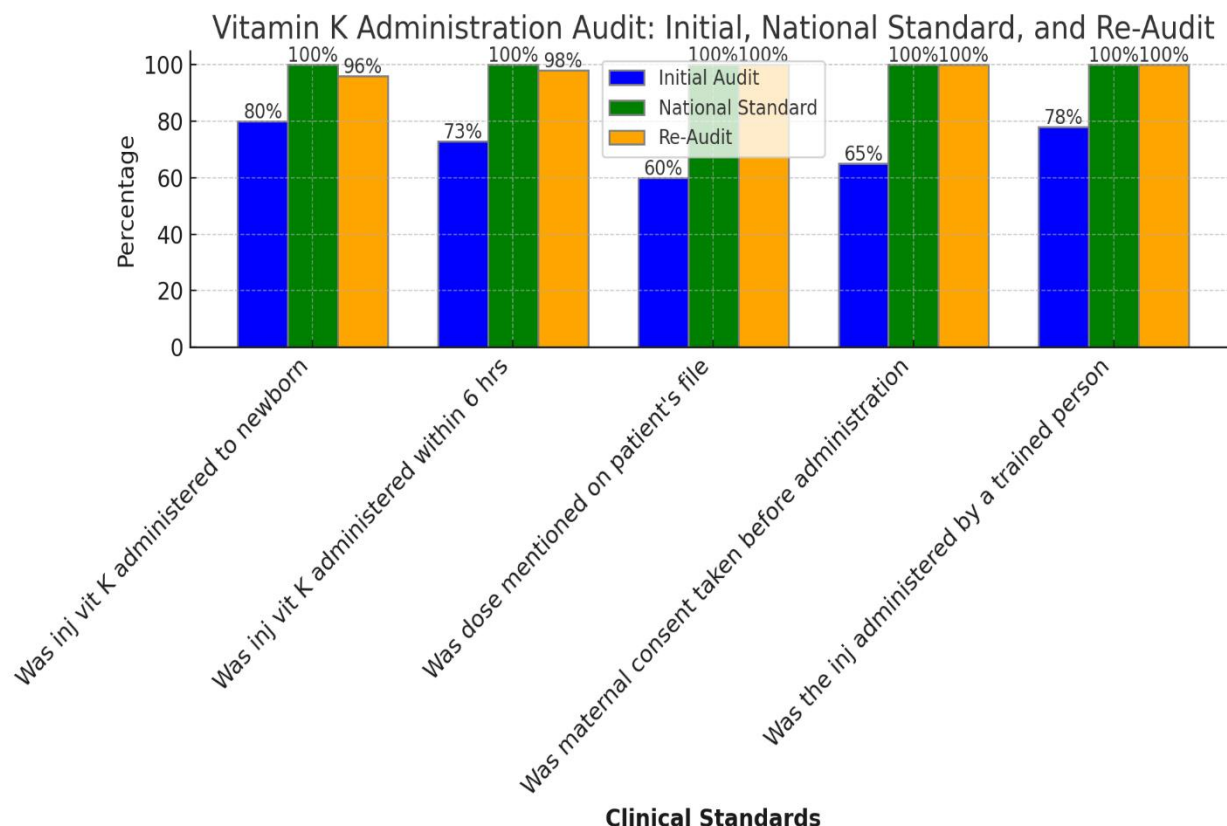
The audit initially conducted in early 2024 revealed several areas where compliance with vitamin K administration protocols was less than satisfactory. Notably, only 80% of newborns received the vitamin K injection, and just 73% of these were administered within the critical six-hour window following birth, suggesting significant lapses in adherence to established guidelines. Additionally, the documentation was insufficient, with only 60% of cases having the vitamin K dose properly recorded in the patient files. Maternal consent, a crucial step in the process, was obtained in only 65% of the instances, highlighting a gap in the informed consent process. Lastly, the personnel administering the injection were confirmed to be adequately trained in 78% of the cases, indicating a need for broader staff training and compliance.

These discrepancies prompted several targeted recommendations aimed at improving compliance rates, which were then evaluated in a re-audit conducted six months later. The re-audit results demonstrated substantial improvements across all metrics. Compliance with the standard of administering vitamin K within six hours of birth improved to 98%, and the overall administration rate rose to 96%. Remarkably, documentation practices saw a significant enhancement, with 100% compliance in recording the dosage and administration details in patient files. The process for obtaining maternal consent also reached a 100% compliance rate, reflecting the successful implementation of more rigorous consent procedures. Furthermore, all injections during the re-audit period were administered by personnel verified to have the necessary training.

These findings, analyzed through straightforward statistical methods, underscored the efficacy of the corrective measures introduced following the initial audit. The dramatic improvements observed in the re-audit illustrate the capacity for targeted interventions to rectify deficiencies in clinical practice quickly and effectively. These results not only affirmed the specific changes made within the hospital but also suggested a framework for similar improvements in other settings struggling with compliance to newborn care protocols.

Clinical Standard	Initial Audit (Jan-Feb 2024)	National Standard	Re-Audit (Aug 2024)	Outcome
Was injection Vitamin K administered to newborn?	80% (104/130)	100%	96% (72/75)	Improved
Was injection Vitamin K administered within 6 hours?	73% (95/130)	100%	98% (73/75)	Improved
Was dose mentioned on patient's file?	60% (78/130)	100%	100% (75/75)	Met
Was maternal consent taken before administration?	65% (84/130)	100%	100% (75/75)	Met
Was the injection administered by a trained person?	78% (101/130)	100%	100% (75/75)	Met





Discussion

The results of the audit conducted at Tehsil Headquarter Hospital Ferozewala align with several studies, highlighting both similar improvements and ongoing challenges in the administration of vitamin K to newborns. The significant improvement in compliance with the administration protocol following targeted interventions mirrors findings from studies like the one at University Maternity Hospital Limerick, where compliance with vitamin K injection reached 96%, and documentation improved significantly post-intervention (14). Similarly, the study at Gold Coast University Hospital also demonstrated high rates of vitamin K administration, with 95.6% receiving the injection, although challenges remained in addressing parental refusal(15).

The observed increase in documentation accuracy and maternal consent compliance in the re-audit is a commendable achievement, yet similar audits underscore the critical role of consistent parental education. A study by Loyal et al. (2019) highlighted that some parents refuse intramuscular vitamin K due to mistrust of medical advice or a preference for natural remedies, pointing to a need for improved communication strategies (1, 4).

However, a limitation of the current audit and similar studies is the reliance on short-term metrics, such as immediate compliance and documentation, without investigating the long-term impact on newborn health outcomes. While compliance improved to nearly 100%, the risk of vitamin K deficiency bleeding (VKDB) persists, particularly in cases of parental refusal or incomplete regimens, as seen in studies from the United States and Europe (16).

Moreover, the current audit does not address the broader issue of alternative prophylactic methods, such as oral vitamin K, which has been debated as less effective compared to intramuscular administration (17). This contrasts with other studies, which suggest that while oral regimens may be feasible, they require strict adherence to multiple doses, posing challenges for effective long-term prophylaxis.

The audit's success in improving compliance underscores the importance of targeted interventions and continuous monitoring. However, broader efforts focusing on parental education and exploring long-term outcomes remain critical for optimizing newborn care practices globally.

Conclusion

The audit and subsequent re-audit conducted at Tehsil headquarter hospital Ferozewala have provided crucial insights into the administration of vitamin K to newborns, showcasing significant improvements in compliance rates following targeted interventions. From the initial findings where compliance was notably below the desired standards, the re-audit demonstrated remarkable gains with nearly all parameters meeting or exceeding the benchmarks. Specifically, the timely administration of vitamin K within six hours of birth rose from 73% to 98%, and documentation practices saw a perfect compliance rate of 100%.

These outcomes not only underscore the efficacy of the implemented recommendations, including enhanced staff training, improved stock management, and strengthened consent procedures but also highlight the critical role of continuous monitoring and re-evaluation in healthcare settings. The success of this audit cycle suggests that similar approaches could be beneficial in other institutions facing challenges in adhering to established newborn care protocols.

As the hospital moves forward, it is imperative to continue these audits regularly. Future research should aim to explore long-term outcomes associated with improved compliance in vitamin K administration and possibly extend the scope to include other aspects of neonatal care. The significant improvements observed serve as a robust foundation for ongoing efforts to optimize newborn health outcomes, advocating for a sustained commitment to quality and safety in clinical practices.

References

1. Loyal J, Danziger P, Wood KE. Midwives' Perspectives about Vitamin K Prophylaxis Against Vitamin K Deficiency Bleeding of the Newborn. *Maternal and child health journal*. 2022;26(8):1641-8.
2. Al-Zuhairy SH. Late vitamin K deficiency bleeding in infants: five-year prospective study. *Jornal de Pediatria*. 2021;97(05):514-9.
3. Majid A, Blackwell M, Broadbent RS, Barker DP, Al-Sallami HS, Edmonds L, et al. Newborn vitamin K prophylaxis: a historical perspective to understand modern barriers to uptake. *Hospital pediatrics*. 2019;9(1):55-60.
4. Loyal J, Weiss TR, Cheng JH, Kair LR, Colson E. Refusal of vitamin K by parents of newborns: a qualitative study. *Academic pediatrics*. 2019;19(7):793-800.
5. Ng E, Loewy AD. Guidelines for vitamin K prophylaxis in newborns. *Paediatrics & child health*. 2018;23(6):394-7.

6. Sankar M, Chandrasekaran A, Kumar P, Thukral A, Agarwal R, Paul V. Vitamin K prophylaxis for prevention of vitamin K deficiency bleeding: a systematic review. *Journal of Perinatology*. 2016;36(1):S29-S35.
7. Mihatsch WA, Braegger C, Bronsky J, Campoy C, Domellöf M, Fewtrell M, et al. Prevention of vitamin K deficiency bleeding in newborn infants: a position paper by the ESPGHAN committee on nutrition. *Journal of pediatric gastroenterology and nutrition*. 2016;63(1):123-9.
8. Warren M, Miller A, Traylor J, Sidonio R, Morad A, Goodman A, et al. Late vitamin K deficiency bleeding in infants whose parents declined vitamin K prophylaxis—Tennessee, 2013. *Morbidity and Mortality Weekly Report*. 2013;62(45):901.
9. Shearer MJ. Vitamin K deficiency bleeding (VKDB) in early infancy. *Blood reviews*. 2009;23(2):49-59.
10. IJland MM, Pereira RR, Cornelissen EA. Incidence of late vitamin K deficiency bleeding in newborns in the Netherlands in 2005: evaluation of the current guideline. *European journal of pediatrics*. 2008;167:165-9.
11. Sutor AH, von Kries R, Cornelissen ME, McNinch AW, Andrew M. Vitamin K deficiency bleeding (VKDB) in infancy. *Thrombosis and haemostasis*. 1999;81(03):456-61.
12. Sutor AH, editor *Vitamin K deficiency bleeding in infants and children*. Seminars in thrombosis and hemostasis; 1995: Copyright© 1995 by Thieme Medical Publishers, Inc.
13. Wan P, Chan H, Nadia A. ASSESSMENT OF THE PRACTICE IN PREPARING MEDICATIONS FOR INTRAVENOUS ADMINISTRATION ACCORDANCE TO PEDIATRIC INJECTABLE DILUTION AND ADMINISTRATION PROTOCOL IN NEWBORN INTENSIVE CARE UNIT (NICU), HOSPITAL SULTANAH BAHYAH. KEDAH STATE HEALTH DEPARTMENT.227.
14. Ijaz A, Mohamed M, Asghar M, Khan R, Zia M, Al Asaaf N. P486 Audit of prophylactic vitamin k documentation in university maternity hospital limerick. *Archives of Disease in Childhood*. 2019;104(Suppl 3):A347.
15. Wong M. VITAMIN K REFUSAL AND OUTCOMES OF ROUTINE MEDICAL COUNSELLING. *Journal of Paediatrics and Child Health*.. 2019;55:14407-40.
16. Araki S, Shirahata A. Vitamin K deficiency bleeding in infancy. *Nutrients*. 2020;12(3):780.
17. Jullien S. Vitamin K prophylaxis in newborns. *BMC pediatrics*. 2021;21:1-7.