Ir Med J; November-December 2023; Vol 116; No. 10; P878
14th December, 2023

Head circumference measurements: Quality improvement initiative

S.A.A. Allawendy[1], U. Khan1, M. Phipps[2], M. Kenosi[1]

1. Department of Paediatrics and Child Health, Cork University Maternity Hospital
2. Department of Paediatrics, CHI at Temple Street

Abstract

Aim
To increase compliance of head circumference measurements within 24 hours of admission, in all babies admitted to the neonatal unit from 49% to 100% over a six month period.

Methods
We used HSE QI tools to highlight the steps of the admission process and identify aspects needing improvements; our drivers were centred on communication, education, and documentation. Our interventions included education of NCHDs, midwives and health care assistants.

Results
Compliance of NCHDs recording head circumference measurement increased from 49% to 100% in three months, which was a shorter time frame than our initial target of six months.

Discussion
We successfully highlighted the importance of quality improvement initiatives as a continuous dynamic process which can offer solutions for problems in day to day practice.

Introduction

Serial head circumference (HC) measurement is a vital part of identifying abnormal brain growth development and to ensure timely management, especially in preterm babies with severe IVH and ventriculomegaly. Microcephaly is defined as the head circumference measurement below the 1st percentile on growth chart, and can be the result of the abnormal brain development in the womb or in infancy. Potential causes can include genetic abnormalities, TORCH infections, and chromosomal abnormalities such as Down syndrome, craniosynostosis, cerebral anoxia, severe malnutrition, and exposure to certain drugs, alcohol or other toxic chemicals in the womb[1]. Consequences include global developmental delay, intellectual disabilities and seizures. Another condition with serious consequences if not diagnosed in a timely manner includes pathological macrocephaly due to hydrocephalus,

defined as head circumference above 99th centile and/or crossing two or more centiles in a short span of time[2].

Our audit was completed in January 2021, To ensure that the standards for measuring OFC and plotting growth charts on the day of admission, throughout the inpatient stay, and on the day of discharge in our neonatal unit were met, guidelines were established. In accordance with the guidelines, head circumference measurements were taken in the delivery rooms or on admission as part of the initial newborn check. Measuring OFC upon admission showed no improvement; compliance remained at 49%.

The author's aim was to increase compliance of head circumference measurements within 24 hours of admission in all babies admitted to the neonatal unit from 49% to 100% by 6 months

Methods

A questionnaire regarding the difficulties of measuring OFC on admission and how we can improve this was distributed to NCHDs in CUMH neonatal unit. The main obstacles identified were about the process being overlooked in the busy environment and the time consuming process of finding the measuring tape. The results were used to fill in the cause root analysis and build up the driver diagram (HSE tools of quality improvement)[3,4]. Ideas for changes have been implemented which include: adding HC to the cot card by midwives on admission bay, and to NCHDs morning handover of admitted babies. The health care assistants were informed about the availability issues and a separate slot on the admission trolley has been assigned to keep measuring tapes. Data were collected from electronic charts on babies admitted before and after implementation. 6 PDSA (Plan-Do- Study- Act) cycles were done over a period of 3 months. Changes were applied in relation to review of the driver diagram.

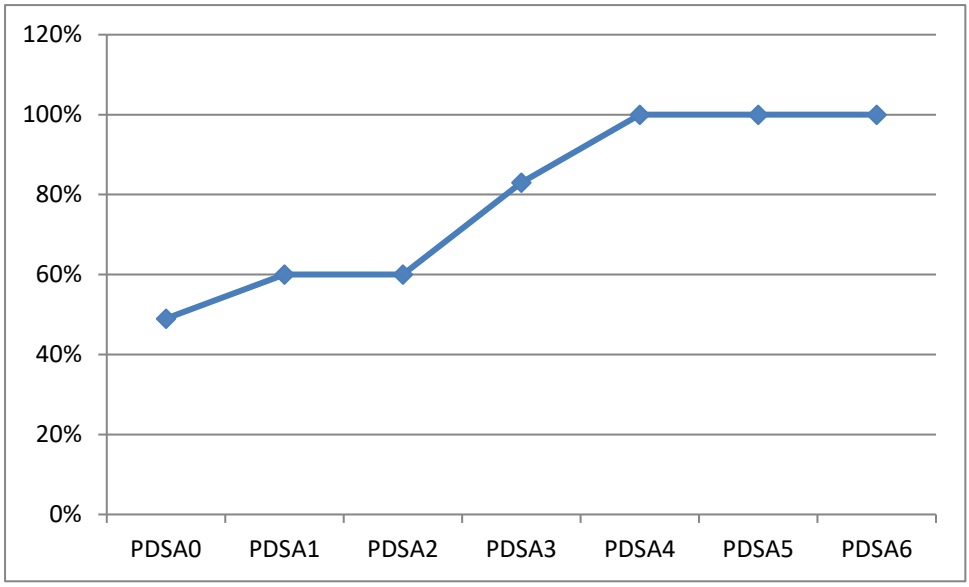
Results

Prior to starting this initiative, 49% of the admitted babies has the HC measure. This result came from an audit performed in 2021, the same results came out on a re-audit this year. After implementation of first changes according to driver diagram, the compliance increased to 60% after the first PDSA cycle. A feedback from the stakeholders showed some further details need some changes. One of those included making the measuring tape more obvious. To assist in this, we put a different container on top of admission trolley with the measuring tape.

With the second PDSA cycle we formally included the OFC of admitted babies in the morning handover. This increased the measurements to 83%. We completed a teaching session with NCHDs after PDSA 3 to demonstrate the results, which had increased the percentage of HC measurements to 100%. (Figure 1). We have moved on to the next level of quality

improvement, which is sustainability, by spreading our actions, receiving continuous feedback, and holding teaching sessions. We plan to relaunch the project later this year to ensure sustainability because we met the goal before the deadline.

FIGURE 1



Discussion

Quality improvement is a continuous process that allows us to monitor and improve our services. Using structured approach and toolkits help to understand the system and quantify the problem. PDSA cycles allowed us to review our implemented ideas, which otherwise might have been overlooked with time, and bring up some details we might not have been aware of. Working in a team and engaging stakeholders is critical in the success of any quality improvement project. Feedback and communication after implementation of changes and through the process gives a proper view of the workflow.

The project discussed above was a practical example of the application of quality improvement toolkits. It demonstrated the benefits of using this process to make great changes to challenges within our practice. These measures can be applied to day-to-day practice regardless of the complexity of the challenge.

In conclusion, quality improvement toolkits are a very effective method of ensuring change. Giving a clear measurable outcome helps in accurate assessment of the progress of any quality improvement initiative.

Ir Med J; November-December 2023; Vol 116; No. 10; P878
14th December, 2023

Declarations of Conflicts of Interest:

None declared.

Corresponding author:

Samy Abdelmoneim Allawendy,
Department of Paediatrics and Child Health,
Cork University Maternity Hospital,
Co. Cork,
Ireland.
E-Mail: samy@allawendy.co.uk

References:

1. Von der Hagen M , Pivarcsi M, Liebe J , et al (2014). Diagnostic approach to microcephaly in childhood: a two-center study and review of the literature. Developmental medicine and child neurology, 56(8), 732–741. https://doi.org/10.1111/dmcn.12425
2. Stoler-Poria S, Lev D, Schweiger A, et al (2010). Developmental outcome of isolated fetal microcephaly. Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology, 36(2), 154–158. https://doi.org/10.1002/uog.7556
3. Ogrinc G, Davies L, Goodman D, et al. SQUIRE 2.0 (Standards for Quality Improvement Reporting Excellence): revised publication guidelines from a detailed consensus process. 2015; BMJ Qual Saf Published Online First: 14 September 2015. doi: 10.1136/bmjqs-2015-004411.
4. Health Service Executive. Quality Improvement Division. 2016; Framework for Improving Quality in our Health Service.