Introduction of a quality metric 'obstetric dashboard' at a tertiary centre to continuously measure neuraxial complications on labour ward

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Introduction

Accidental dural puncture (ADP) rate is generally recognised as a key quality indicator for obstetric anaesthesia services. [1] Our unit transferred to using Epic – a fully electronic patient record (EPR) in 2019. Prior to this, obstetric neuraxial complications encountered in our unit were recorded manually on a paper-based system. We saw the EPR as an opportunity to improve outcome data quality, and so we developed an electronic 'obstetric dashboard' to automatically capture and report our neuraxial complications directly from the EPR.

Methods

Development of our dashboard involved a number of steps which required close co-operation between clinicians and our business informatics team:

1) We established local consensus through collaborative discussion at our departmental obstetrics research and quality improvement meeting to decide a quality metric core outcome set based on the GPAS standards for obstetric anaesthesia, Royal College of Anaesthetists QI Compendium, and OAA core indicator set Delphi study. This led to us deciding to focus on ADP and post dural puncture headache (PDPH) rates as first priority.
2) We collaborated with our trust's business informatics (BI) team to write a query in Structured Query Language (SQL) which could find all patients with "dural tap" recorded as a complication in their procedure note, and patients with PDPH added to their EPR problem list. The results were displayed in a web based PowerBI (Microsoft) dashboard.
3) This dashboard data then needed to be validated against our paper-based system by manual review of anaesthetic records (Jan to Oct 2021), and adjustments to search queries to ensure that the SQL query was accurately finding all patients who had experienced ADP or PDPH.
4) Agreeing a local 'workflow' for recording complications on the EPR to optimise data quality, facilitated by producing a 'quick guide' for easy reference.
5) Continuous data quality monitoring and obtaining user feedback by labour ward data quality lead.

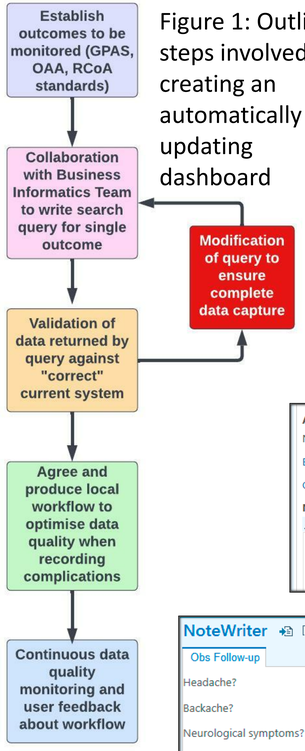


Figure 1: Outline of steps involved in creating an automatically updating dashboard

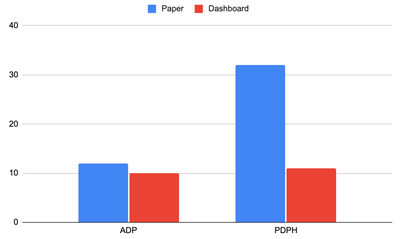
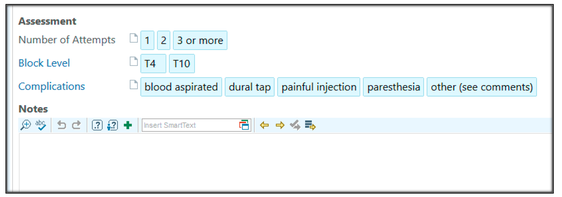


Figure 2: the results of dashboard data validation showing automatic identification of ADP and PDPH from the EPR compared to our current followup system



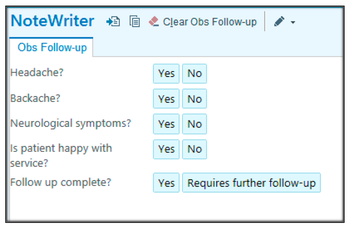


Figure 3: the user interface of the Epic EPR "notewriter" where anaesthetic procedures and followup can be documented illustrating the difference between structured data (the blue boxes which can be clicked) and free text (the white "notes" box).

Results

Validation of the dashboard data was carried out against our paper based system. Our current system found 12 patients with ADP and 32 with PDPH. The dashboard identified 10 patients with ADP and 11 with PDPH giving congruence of 83% and 33% respectively.

Discussion

For tracking of accidental dural puncture where the complication was recorded in a structured data format, our dashboard showed an excellent data capture rate. Discrepancies were due to some complications being recorded as undetectable 'free text' – automated detection of this is far more difficult than data which is "tagged" (see Fig 3). This was most apparent for PDPH which was frequently just documented in prose notes. Introducing a standard workflow going forward will encourage recording of ADP and PDPH in a structured data format and we anticipate our detection rate to greatly improve following this.

Our dashboard is a proof of concept which we believe shows the power of EPRs to generate continuous data for quality improvement. The issues we encountered were mainly due to inconsistency in data recording by clinicians; improving accuracy involves ongoing education of both permanent and rotating staff, and continuous monitoring of data quality which we believe requires a consultant data quality lead for obstetric anaesthesia. Our next steps involve adding search queries which can automatically track our numbers of:

- epidural insertions (thus providing a denominator and an ADP rate)
- Caesareans under general anaesthesia
- Epidurals requiring resiting

The ongoing challenge will be validation of data to ensure the accuracy of the dashboard, which can be an extremely time consuming process.

EPRs offer a powerful opportunity for anaesthetists who engage in research, audit or quality improvement –a dashboard like ours can be easily created with virtually any EPR and with sufficiently robust and validated search queries can provide reliable, automatically updating information.

References

1. Bamber JH, Lucas DN, Plaat F, et al. The identification of key indicators to drive quality improvement in obstetric anaesthesia: results of the Obstetric Anaesthetists' Association/National Perinatal Epidemiology Unit collaborative Delphi project. Anaesthesia. 2020;75(5):617-25.