Lumbar Punctures in the AEC
A comprehensive service evaluation and audit

Introduction

Background

- Lumbar puncture (LP) is an integral diagnostic tool currently employed by acute physicians in a number of settings.
- The Ambulatory Emergency Clinic (AEC) is one such setting designed to reduce the load on the Emergency Department (ED) and inpatient medical units for ambulatory medical patients with direct, rapid access to consultant care if required.
- Necessary investigations, commencement of management and arrangement of follow-up specialist referral can be done there.
- LP in this setting is used in a wide range of conditions — those most commonly encountered include idiopathic intracranial hypertension (IIH) and subarachnoid hemorrhage (SAH).
- For patients with thunderclap headache and possible SAH:
  - Full adherence should be expected as a minimum in this domain.
- Given the potential for significant morbidity and mortality associated with such diagnoses, it is important that there is uni-annual reporting against a composite gold standard was created from available literature.

Methods

- Our work was divided into two parts:
  1. A service evaluation, gathering insight into demographics, routes of admission, presenting symptoms, investigations and outcomes of patients receiving an LP.
  2. An audit of clinical practice in patients with thunderclap headache/possible SAH and possible IIH, comparing practice against a composite gold standard, derived from literature.

Aims & Objectives

- To improve efficiency and quality of patient experience for patients requiring LP in acute medicine and the wide Trust.
- To improve uniformity in LP clinical and procedure documentation to ensure maximal patient safety.

Results

- We looked at all LPs in the AEC between 1st September 2016 and 31st December 2017.
- Retrospective collection of a range of data from scanned hospital notes and hospital computer systems.
- For certain cohorts — i.e., patients where LP was carried out to investigate possible SAH or IIH — further specific data was collected.
- Patients in total underwent LP in AEC, for various indications, over the sample period.

1) Service Evaluation

Overview

- In a total of 9 patients with thunderclap headache and possible SAH:
  - All had a CT head scan
  - All had a successful LP at the first attempt
  - 33% did not have CSF sent for xanthochromia/specetrophotometry
  - All had LP within 24 hours of presentation and after a presumed, 12 hour onset of symptoms

In a total of 8 patients with suspected IIH:

- All had LP at the first attempt
- None had failed initial attempts — possibly reflecting difficulties in these patients (often with a high BMI)
- None was a further brain imaging — attending AEC for an elective therapeutic LP for pressure relief
- All had CSF opening pressure recorded

Conclusions

- The AEC is an ideal environment for the timely diagnosis and management for patients who are ambulatory.
- The Acute Medicine lanes are on the whole highly adept at performing LPs successfully when indicated.
- More uniformity is required in LP operating procedure (including when opening CSF pressure is measured and what specific lab tests are requested with CSF sample), and also post-procedure documentation in patient notes.

2) SAH and IIH Audit

Overview

- There were 24 hours to perform the LP if the patient is not hypotensive.
- If LP is performed, it should be at the earliest time possible while the patient is awake.
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Methods

- An audit was carried out assessing the performance of LP as indicated in the work by Najjar Y, Al-Najjar A.
- We are 100% compliant with having an up-to-date date clotting screen prior to LP.
- All had LP within 24 hours of presentation.
- A clear history of headache including time of onset and time to peak intensity was never recorded.

Patients with suspected SAH: Discussion

- A clear history of headache indicating time of onset and time to peak intensity was never recorded.

Time of attendence to AEC was seldom recorded

- Thus, it was not possible to assess which patients had a CT head within 12 hours from the onset of symptoms
- Further: not possible to assess whether patients had a lumbar puncture in the correct timeframe
- We are 100% compliant with having an up-to-date date clotting screen prior to LP.

Opening pressures are only recorded 33% of the time — whilst not vital for radio logic and medical decisions in the department it is good practice to record LP pressures in all patients regardless of possible diagnosis: headache should be the same as for uniform dataset and when possible: LP pressures are always more accurate

Only six of the nine LPs audited involved CSF being sent for xanthochromia testing — the most accurate way to confirm a SAH is an essential step in the diagnosis of SAH.

Patients with suspected IIH (previously known as benign intracranial hypertension): Discussion

- IIH is a diagnosis of exclusion, with a risk of visual loss and a reduction in quality of life defined by clinical criteria.
- Patients with suspected IIH:
  - Some had LP within 24 hours of presentation.
  - All had LP within 24 hours of presentation.
  - All had LP within 24 hours of presentation.

Conclusions and Action Plan

- To improve uniformity in LP clinical and procedure documentation to ensure maximal patient safety.
- To improve efficiency and quality of patient experience for patients requiring LP in acute medicine and the wide Trust.
- LP documentation in patient notes, so it is clear exactly how the procedure was performed, what tests have been requested and what follow-up is planned.

- Patients with thunderclap headache and possible SAH:
  - Full adherence should be expected as a minimum in this domain.
- Given the potential for significant morbidity and mortality associated with such diagnoses, it is important that there is uni-annual reporting against a composite gold standard was created from available literature.

- For LP in SAH, this included national guidance for analysis of CSF in suspected SAH, and a BMJ cross-sectional study considering guidelines and dichotomous outcomes.
- For LP in IIH, a consensus view was taken — after reviewing all of the up-to-date literature available.

- The AEC is an ideal environment for the timely diagnosis and management for patients who are ambulatory.
- The Acute Medicine lanes are on the whole highly adept at performing LPs successfully when indicated.
- More uniformity is required in LP operating procedure (including when opening CSF pressure is measured and what specific lab tests are requested with CSF sample), and also post-procedure documentation in patient notes.

- The lack of uniformity in LP operating procedure may increase the risk of important diagnoses being missed, or delayed, (i.e., patients with thunderclap headaches not having CSF sent for xanthochromia).
- There needs to be better quality and more standardised post-LP documentation in patient notes, so it is clear exactly how the procedure was performed, what tests have been requested and what follow-up is planned.

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