Letter: Thirty-Day Hospital Readmission and Surgical Complication Rates for Shunting in Normal Pressure Hydrocephalus: A Large National Database Analysis

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Letter to the editor of Neurosurgery
In response to: *"Thirty-Day Hospital Readmission and Surgical Complication Rates for Shunting in Normal Pressure Hydrocephalus: A Large National Database Analysis"* by J.L. Nadel *et al.*

Word count: 577
Tables/Figures: 0
References: 7

Conflicts of interest and disclosures

No funding was received for the conduction of this study. LD's research fellowship is sponsored by B.Braun. LDW has received honoraria from and served on advisory boards for Medtronic, B.Braun and Codman. AKT research time was supported by the National Institute for Health Research University College London Hospitals Biomedical Research Centre. The other authors have no disclosures to report. Some of the results discussed in the manuscript (lines 24-35) are part of a larger study previously published in the Journal of Neurosurgical Anesthesiology (D'Antona L, Blamey SC, Craven CL, et al. Early Postoperative Outcomes of

Normal Pressure Hydrocephalus: Results of a Service Evaluation. *Journal of Neurosurgical Anesthesiology*. 9000;Publish Ahead of Print).

To the Editor,

Nadel *et al.* recently reported the surgical outcomes of a large United States cohort of 974 Normal Pressure Hydrocephalus (NPH) patients treated with ventricular shunts. The data for this study was retrospectively extracted from an anonymised insurance database. Their results demonstrate high rates of perioperative surgical complications and 30-day readmission, occurring in 21.15% and 7.29% of the patients respectively [1]. We would like to commend the authors for the useful work. As they mention, most of the evidence on NPH outcomes is based on single-centre studies with results that are often not generalisable to other centres. The use of database information collected nationally has the great advantage of providing results that are less affected by reporting bias. Moreover, compared to systematic reviews, this approach avoids the risks of publication bias as well.

There is an increasing trend toward subspecialist neurosurgical practice in the UK. A centre specialised in the management of hydrocephalus patients may have better outcomes than others. Unfortunately, Nadel *et al.* do not stratify their results by different centres and we cannot tell from the data set whether these surgeries are being performed by specialists. This leaves the reader with the idea that shunting NPH patients is high risk, with 25% of the treated patients having perioperative complications or requiring readmission.

In our experience the postoperative outcomes of NPH patients treated with shunts are very good when surgery is performed in a centre specialised in hydrocephalus. We have recently reported the early postoperative outcomes of a consecutive series of 45 NPH patients treated with ventriculoperitoneal shunt at the National Hospital for Neurology and Neurosurgery (London, UK) [2]. We investigated surgical and medical complications in detail, through the use of a prospective standardised survey [3]. In the early postoperative period (before discharge), we observed only 1 surgical complication in a patient who developed a ventricular catheter tract haemorrhage which was conservatively managed. The 30-day readmission rate was 2%, with only one patient requiring readmission for revision of the ventriculoperitoneal shunt distal catheter. The overall rate of having a surgical complication or readmission within 30 days from the day of surgery was 4% (2 cases). There was no 30-day mortality, no unexpected return to theatre or admission to intensive care [2]. We believe that the low rate of complications in our centre is the result of the standardised multidisciplinary approach in the management of NPH.

Systematic reviews have demonstrated that shunting is effective in 75-82% of NPH patients and that the risk of complications is lower than the results reported by Nadel *et al.* (8.2%) [4,5]. As discussed above, systematic reviews could be affected by publication bias. However, since specialised centres are more likely to publish their results, systematic reviews are probably more representative of the outcomes that patients would achieve if treated in a centre with expertise in NPH management.

While we thank Nadel *et al.* for their useful contribution, the expertise of the different centres contributing data to their study should have been taken into account [1]. In our view the data demonstrates poor outcomes from surgery for NPH in a non-specialist setting, rather than an inherent risk in managing this patient population. NPH is an ameliorable pathology that can be managed safely in experienced hands. Delayed or withheld treatment worsen outcomes affecting quality of life [6,7]. We suggest that prompt assessment by a specialised centre should be offered to any patient with a confirmed or suspected diagnosis of NPH.

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