

## **Risk of hospital-acquired COVID-19 infection during admission for semi-urgent neurosurgical procedures**

To the Editor,

The Corona Virus Disease 2019 (COVID-19) pandemic has posed unprecedented challenges to modern healthcare systems. Clinical attention and resources have shifted towards the implementation of transmission containment measures and the management of patients diagnosed with this disease. This has inevitably caused reorganisation of the service provided in all medical specialties, including neurosurgery. Cancellation of elective neurosurgical cases and significant reductions in the number of neurosurgical operations have occurred worldwide.<sup>1-7</sup> Moreover, it has been demonstrated that patients with perioperative diagnosis of COVID-19 have higher risk of mortality when undergoing surgery (23.8%).<sup>8</sup> The next challenge for neurosurgical practices will be to find a balance between the benefits of surgery and the risk of nosocomial infection, to allow neurosurgical services to resume in a safe and sustainable manner. Information on the risks of nosocomial acquisition of COVID-19 will be essential in order to achieve this balance and to counsel surgical patients appropriately.

In this letter we report the risk of hospital-acquired COVID-19 infection in a group of 55 consecutive patients undergoing semi-urgent neurosurgical procedures at the National Hospital for Neurology and Neurosurgery (London, UK) during the lockdown period (23/03/2020 to 04/05/2020). Patients were retrospectively identified through screening the theatre lists database. Data collection was performed through the hospital electronic records and a short patient telephone survey. Patients who were discharged from hospital for at least 14 days (at the time of the study) were contacted for a short telephone survey including the following two questions: (i) Have you had a diagnosis of COVID-19 in the 14 days following your discharge from hospital? (ii) Have you experienced any of the following symptoms in the 14 days following your discharge from hospital: Cough, shortness of breath/difficulty breathing, fever, chills, muscle pain, headache, sore throat, loss of taste/smell?<sup>9</sup> A diagnosis of COVID-19 was confirmed when a respiratory swab sample tested positive for SARS-CoV-2 by RT-qPCR, clinically suspected when the patient presented 2 out of the 8 previously listed symptoms, and was excluded in patients with a negative COVID-19 swab test and patients who did not present the typical symptoms. **Table 1** provides information on the reorganisation of the neurosurgical services in our centre.

Fifty-eight neurosurgical procedures were planned in the period between the 23/03/2020 and the 04/05/2020. Two of these procedures were postponed and did not take place during the study period due to positive preoperative COVID-19 test results of the patients. Fifty-five consecutive patients undergoing 56 neurosurgical procedures were included in the study. The patients' baseline clinical characteristics are described in **Table 2**. Compared to the neurosurgical case load observed in the same dates of 2019, the number of operations performed in 2020 was significantly lower (373 and 56 respectively, Wilcoxon-Mann-Whitney test  $p < 0.001$ ). All neurosurgical sub-specialties were affected (**Figure 1**).

Most patients (68%) were admitted on the day of surgery or the day before. Preoperative COVID-19 tests were performed in 24 of the 58 planned procedures, 4 of these tests were positive and the procedures were postponed. Two of the procedures were postponed to later than the study period and are therefore not included in these results. Three of the 4 patients with positive pre-operative COVID-19 diagnosis were tested on the day of admission and the fourth was tested before hospital admission (in the community). Among the operations performed, 30 (54%) were oncological, 10 (18%) spinal, 10 (18%) functional, 4 (7%) cerebrospinal fluid related and 2 (4%) were explorations of intrathecal drug delivery systems. The mean operations duration (from start to stop of anaesthesia) was 195 ( $\pm 110$ ) minutes. The average in-hospital length of stay was 4 ( $\pm 5$ ) days. Two patients died, 1 of severe intraoperative bleed during a brain tumour excision and 1 of postoperative cardiac arrest. Both patients were considered at high surgical risk and had ASA grade of IV. No other complication occurred. Our mean follow-up was 42 days ( $\pm 14$ , range 18-60).

Fifty patients took part in the telephone survey. None of the patients had diagnosis of COVID-19 in the 14 days following hospital discharge. Three patients had clinically suspected COVID-19 describing 2 or more of the 8 typical symptoms, however tested negative on SARS-CoV-2 PCR of respiratory tract swabs. Nine patients reported only one of the typical symptoms, this was most commonly headache (5 patients) or muscle pains (2 patients). Thirty-eight of the patients had none of the typical COVID-19 symptoms in the 14 days following hospital discharge.

In conclusion, none of the 55 consecutive patients contracted COVID-19 as a result of their hospital admission. Moreover, preoperative testing identified 4 patients positive to COVID-

19 and led to postponement of their operations. This is particularly important if we consider the previous report of worse surgical outcomes in patients with COVID-19 disease.<sup>8,10</sup> In this climate of uncertainty, it is fundamental to maintain continuous active surveillance, but a cautious restart of neurosurgical services is possible. These results suggest that, by reducing the neurosurgical case load, following infection prevention and control measures and maintaining a high level of vigilance, the risk of nosocomial contraction of COVID-19 can be well controlled.

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**Conflicts of interest**

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**Ethical approval and patient consent**

This study was conducted as part of a governance service evaluation in accordance with the departmental and hospital guidelines of the National Hospital for Neurology and Neurosurgery (registration number 30-202021-SE) and did not require formal ethical approval. All patients provided verbal consent to participate in the telephone survey and to be included in the study.

**Author contributions**

LD and AKT designed and conceptualised the study. LD, JP, HH and IH acquired the data. LD analysed the data and drafted the manuscript. LD, SDS, CC, LT, LDW and AKT interpreted the results and revised the manuscript for intellectual content.

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**Figure 1.** Comparison of number of neurosurgical cases performed in the same year period in 2020 and 2019 (between 23rd of March and 4th of May). Oncology includes brain tumours biopsies and excisions. CSF indicates cerebrospinal fluid related surgery including shunts, lumbar drains, intracranial pressure monitors. Peripheral includes peripheral nerve operations and muscle biopsies.

**Table 1.** Reorganisation of neurosurgical services during COVID-19 pandemic at the National Hospital for Neurology and Neurosurgery

**Table 2.** Baseline clinical characteristics of 55 patients undergoing neurosurgical procedures during the study period (23/03/2020 to 04/05/2020).