

Letter to the Editor

Learning Lessons from the Coronavirus-induced Disease 2019 Pandemic to Improve Outcomes Following Carotid Interventions

Kamran A Gaba^{1,2*}, Charles Vincent³ and Prem Chana⁴

¹Medical Research Council Population Health Research Unit, Nuffield Department of Population Health, UK

²Clinical Trial Service Unit and Epidemiological Studies Unit, Nuffield Department of Population Health, UK

³Department of Experimental Psychology, University of Oxford, UK

⁴Department of Academic Surgery, St Mary's Hospital, Imperial College, UK

***Corresponding author**

Kamran Gaba, Medical Research Council Population Health Research Unit, Nuffield Department of Population Health, University of Oxford, OX3 7LF, UK, Email: kamran.gaba@ndph.ox.ac.uk

Submitted: 07 July 2020

Accepted: 22 July 2020

Published: 25 July 2020

ISSN: 2378-9344

Copyright

© 2020 Gaba KA, et al.

OPEN ACCESS**Keywords**

- COVID-19
- Carotid endarterectomy
- Carotid artery stenting
- Outcomes

Abstract

A novel coronavirus has caused a pandemic, resulting in the deaths of thousands of individuals worldwide. Health systems responded rapidly to this crisis and mobilised resources, maximising the effectiveness of interventions. Lessons can be applied from this experience to improve the safety of carotid interventions.

ABBREVIATIONS

COVID-19: Coronavirus-induced Disease-2019; EPR: Electronic Patient Record; GDP: Gross Domestic Product; SARS-CoV-2: Severe Acute Respiratory Syndrome Coronavirus 2; MDT: Multi-Disciplinary Team; NHS: National Health Service; OECD: Organisation for Economic Cooperation and Development; RCT: Randomised Controlled Trial; UK: United Kingdom

INTRODUCTION

A novel coronavirus (SARS-CoV-2) has caused a pandemic, resulting in the deaths of thousands of individuals worldwide. Health systems have responded rapidly to this crisis and mobilised resources, maximising the effectiveness of interventions. Lessons can be applied to improve the safety of carotid interventions.

PUBLIC HEALTH

Social distancing was implemented globally to limit the spread of coronavirus-induced disease-2019 (COVID-19). This required public education in virus transmission and symptoms requiring quarantining. By improving the public's knowledge of the disease, maximum benefit was achieved. Similarly, patients experiencing neurological symptoms must recognise these and seek medical attention expeditiously to derive maximum benefit from carotid interventions. However, the public's stroke knowledge is poor [1] despite media campaigns encouraging

patients to present to the Emergency Department as soon as they experience neurological symptoms. Stroke media campaigns also do not lead to sustained changes in care-seeking behaviour [2] whilst educational interventions to improve stroke recognition have not demonstrated sustained, long-term improvements [3]. Therefore, patient education must be prioritised to prevent harm from recurrent strokes.

CULTURE CHANGE

Another feature of the response to the COVID-19 outbreak was the collectiveness and camaraderie displayed by the medical workforce. Prior to the emergence of SARS-CoV-2, morale of staff working in the United Kingdom (UK) National Health Service (NHS) was low, contributing to 19% of NHS employees experiencing harassment, bullying or abuse from colleagues [4]. This was higher in ethnic minorities [4]. Incivility has previously been shown to reduce performance by 20-30% [5]. Therefore, a non-confrontational environment must be encouraged and implemented in healthcare to maximise quality of care. This shifts the emphasis from a 'person approach' to a 'system approach' when errors occur due to systemic/organisational failures [6]. Various Specialists were redeployed to manage ventilated patients during the COVID-19 crisis, often with little relevant experience. This had the potential to cause harm but was minimised by using protocols and working as a multi-disciplinary team (MDT) with a 'no blame' culture. Implementation of

evidence-based, protocol-driven care has previously been recommended for patients undergoing carotid interventions [7]. By taking a system approach to human error, a culture of openness may be fostered to encourage learning from adverse events following carotid interventions [6].

TECHNOLOGY

During the COVID-19 pandemic, clinic appointments have increasingly been conducted digitally to reduce viral spread. The UK Government previously suggested that patients will have access to digital consultations by 2024 [8]. This is expected to reduce outpatient appointments by one-third and pressures on General Practitioners, saving 30 million trips to hospital and the NHS £1 billion per year [8]. A new 'NHS App' will also provide advice, allow checking of symptoms and connections with healthcare professionals via telephone and video consultations [8]. This may help patients detect stroke symptoms more effectively.

Use of electronic patient records (EPR) has also allowed improved hygiene practices to reduce the spread of COVID-19. EPRs can be applied to the care of patients undergoing carotid interventions where incorporation of decision-support tools may aid application of evidence-based practice and standardise care [8]. Digitalisation of patient notes with electronic prescribing may also improve documentation and communication. The UK Government has promised to implement "robust, modern Information Technology infrastructure" across the NHS by 2024 [8]. This should improve the quality of referrals for carotid interventions and may facilitate access to specialist advice virtually. EPRs may also allow electronic prescribing, with prompts to avoid interactions or highlight allergies. Harnessing the power of modern technology may therefore improve outcomes in the co-morbid patients undergoing carotid interventions.

RESEARCH

The COVID-19 crisis has demonstrated the power of collaborative research. Since March 2020, publishers have agreed to make their COVID-19-related articles available via open access. Moreover, sharing of data globally has allowed better understanding of the virus and how to treat it most effectively. This extensive data sharing and collaboration can be applied to patients receiving carotid interventions to improve practice.

Moreover, analyses from routinely collected, administrative data from the Office for National Statistics, Hospital Episodes Statistics and Emergency Care Data Set (amongst others) have been used to detect cases and deaths caused by SARS-CoV-2 and plan interventions. Registry data will also be used to follow-up patients in randomised controlled trials (RCTs) evaluating the effectiveness of different medical therapies for treating COVID-19. Whilst RCTs are the 'gold standard' in comparing effectiveness of new interventions to established practice, they are labour-intensive, expensive and require time-consuming data entry and follow-up at several collaborating centres. Findings may not also generalise to contemporary practice due to strict credentialing and enrolment criteria. Large administrative datasets may more accurately reflect the contemporary effect of advances in surgical practice and medical therapy on procedural outcomes following

carotid intervention than results derived from historical RCTs. They also usually contain more patients than RCTs, capture more events and include patients ineligible for inclusion in RCTs, making the population included in registries more representative of the general population. The COVID-19 crisis has therefore shown the potential of administrative data analyses to inform practice in carotid interventions, as an adjunct to RCT findings.

INVESTMENT

The UK Government has invested heavily in the NHS to ensure adequate staff, ventilators and Critical Care beds were available for patients affected by COVID-19. Over £13 billion in NHS debt was written off and large field hospitals were opened throughout the country to increase capacity. Prior to the pandemic, the UK spent 9.7% of its Gross Domestic Product (GDP) on healthcare (Germany and France spent more than 11% of their GDP on healthcare) according to an analysis from the Organisation for Economic Cooperation and Development (OECD) [9]. UK investment in healthcare as a proportion of GDP was also lower than the pooled average of Australia, Canada, Denmark, France, Germany, Holland, Sweden, Switzerland and America (all members of G12) [10]. The UK also had fewer hospital beds per capita, Doctors (2.8 per 1,000 population; average: 3.6) and Nurses (7.9 per 1,000 population) than most European countries [9]. This is below OECD averages and considerably lower than countries of similar economic development [9,10]. Investment in the NHS was recognised as necessary by the UK Government's *NHS Long Term Plan* that pledged to increase NHS funding by £20.5 billion in real terms per year from 2018-2024 [8]. This additional funding would be used to centralise stroke and vascular services, allowing seven-day standards for stroke care, dedicated ambulance services, early supported discharge, improved stroke rehabilitation and re-configuration of carotid interventions as 'urgent', reducing delays [7,8]. This would also allow increases in the workforce of Vascular Surgeons, making it more comparable to countries in Europe, Australasia and North America [9]. By expanding the workforce and reducing delays in carotid interventions, outcomes would be expected to improve.

CONCLUSIONS

The COVID-19 pandemic has challenged the ability of healthcare systems to cope with a rise in admissions of acutely unwell patients globally. However, the versatility shown in adapting to this crisis provides important lessons that can improve the delivery of carotid interventions. By improving public knowledge to recognise and respond to stroke symptoms promptly, harnessing technology and using protocol-driven care to standardise practice in a culture of non-hierarchical, MDT working, outcomes following carotid intervention may be improved. Further investment in healthcare and ongoing collaborative research may further inform practice to reduce morbidity and mortality in these high-risk patients.

FUNDING

This work was supported by the Nuffield Department of Population Health (University of Oxford) and the Medical Research Council. Funders were not involved in any stage of the study design, data collection, analysis, write-up or decision to submit the article for publication.

REFERENCES

1. Lecouturier J, Murtagh MJ, Thomson RG, Ford GA, White M, Eccles M, et al. Response to symptoms of stroke in the UK: a systematic review. *BMC Health Serv Res*. 2010; 10: 157.
2. Marx JJ, Nedelmann M, Haertle B, Dieterich M, Eicke BM. An educational multimedia campaign has differential effects on public stroke knowledge and care-seeking behaviour. *J Neurol*. 2008; 255: 378-384.
3. Yvonne Chan FY, Richardson LD, Nagurka R, Hao K, Zaets SB, Brimacombe MB, et al. Stroke Education in an Emergency Department Waiting Room: A Comparison of Methods. *Health Promot Perspect*. 2015; 5: 34-41.
4. NHS England Survey Co-ordination Centre. *NHS Staff Survey 2019: National Results Briefing*. Oxford: Picker Institute Europe; 2020.
5. Katz D, Blasius K, Isaak R, Lipps J, Kushelev M, Goldberg A, et al. Exposure to incivility hinders clinical performance in a simulated operative crisis. *BMJ Qual Saf*. 2019; 28: 750-757.
6. Reason J. Human error: models and management. *BMJ*. 2000; 320: 768-770.
7. Horrocks M. *Vascular Surgery GIRFT Programme National Specialty Report*, 2018.
8. NHS England. *The NHS Long Term Plan*, 2019.
9. Ward D & Chijoko. *Spending on and availability of health care resources: how does the UK compare to other countries?* London: The King's Fund; 2018.
10. Papanicolas I, Mossialos E, Gundersen A, Woskie L, Jha AK. Performance of UK National Health Service compared with other high income countries: observational study. *BMJ*. 2019; 367: 16326.

Cite this article

Gaba KA, Vincent C, Chana P (2020) Learning Lessons from the Coronavirus-induced Disease 2019 Pandemic to Improve Outcomes Following Carotid Interventions. *Ann Vasc Med Res* 7(4): 1116.