Eur J Vasc Endovasc Surg (2019) 57, 626

INVITED COMMENTARY

Let's Talk Big Data

Jean-Baptiste Ricco [a,*], **Farid Guetarni** [a,b]

[a] Department of Clinical Research and Innovation (DRCI), University Hospital of Poitiers, Poitiers, France
[b] CNAM-EPN5 - 292, Poitiers, France

In this issue, Darrin Clouse and colleagues[1] identified the drivers of 30 day non-ipsilateral stroke after carotid endarterectomy (CEA) by assessing the Vascular Quality Initiative (VQI) database developed in 2011 by the Society for Vascular Surgery (SVS).[2] The authors reported a number of features increasing risk such as combined procedures, haemodynamic fluctuations, and contralateral internal carotid occlusion. To date, because of the rarity of non-ipsilateral stroke risk in patients with CEA, no discernible recommendations have been given. Of note, in this study, non-ipsilateral stroke does not mean contralateral hemispheric stroke as it also includes vertebrobasilar stroke in patients whose vascular anatomy remains unknown, as is the degree of postoperative haemodynamic fluctuation. Furthermore, in this retrospective analysis of 80,230 CEA, the rarity of non-ipsilateral stroke (0.6%) may limit the strength of the statistical analysis.

However, this study is one example of how digitisation of electronic health records has extended the generation of big data to medicine, to such an extent that it is now considered as an alternative to traditional study design. It is especially useful as a means of answering questions regarding rare events following interventions. Furthermore, use of big data is inexpensive and its results are generalisable to "real life" situations.

To this end, a lot of data can be a very good thing. But is this always the case? In fact, large data repositories represent a risk of "quantity over quality." The lack of granularity of mega databases based on administrative coding systems is of genuine concern.[3]

That much said, the VQI registry queried in this study is different, as it operates inside the structure of a patient safety organisation. Each VQI registry tracks demographic, physician, hospital, and patient specific factors that are relevant to the procedure to be performed both in hospital and at ≥ 1 year of follow up. The VQI uses patient identifiers to match with other datasets such as the Social Security Death Index or Medical Claims in conjunction with billing data to ensure that 100% of the sample is being captured. Furthermore, the VQI is not just a clinical registry, but also a network of regional quality improvement groups that provide the structure needed to translate data into practice change.

However, some limitations remain. Even though the data are prospective, the analysis is retrospective, rendering it difficult to draw conclusions on causation. Second, not all potential predictors of outcomes can be captured in a single database. Finally, statistical analysis of these large databases is complex. At a significance level of $p < .05$, it is possible for an article containing more than 20 statistical comparisons to include at least one significant finding that could have occurred by chance.

Despite these limitations, the authors are to be congratulated for having delivered contemporary information on a rare complication following CEA. Nonetheless, what should be remembered is that while many of us have been talking about big data, others actually began to collect and work with big data years ago. The only example of a nationwide vascular registry in Europe came from Sweden and was started in 1987.[4] Why does what has proven possible for the 350 million US population through the SVS-VQI seem out of reach in Europe through the ESVS?

To conclude, although the findings of this study are interesting, their essential message goes well beyond these specific observations. The VQI should be recognised as an innovative experiment and used as inspiration in a European vascular healthcare model.

REFERENCES

1 Darrin Clouse W, Boitano LT, Ergul EA, Kashyap VS, Malas MB, Goodney PP, et al. Contralateral occlusion and concomitant procedures drive risk of non-ipsilateral stroke after carotid endarterectomy. *Eur J Vasc Endovasc Surg* 2019;**57**:619–25.

2 Cronenwett JL, Kraiss LW, Cambria RP. The society for vascular Surgery vascular quality initiative. *J Vasc Surg* 2012;**55**:1529–37.

3 Murthy SC, Blackstone EH. Research based on big data: the good, the bad, and the ugly. *J Thorac Cardiovasc Surg* 2016;**151**:629–30.

4 Venermo M, Lees T. International Vascunet validation of the Swedvasc registry. *Eur J Vasc Endovasc Surg* 2015;**50**:802–8.

DOI of original article: https://doi.org/10.1016/j.ejvs.2018.11.009

* Corresponding author. Department of Clinical Research and Innovation (DRCI), University Hospital of Poitiers, Rue de la Milétrie, 86021, Poitiers, France.

E-mail address: jean.baptiste.ricco@univ-poitiers.fr (Jean-Baptiste Ricco).

https://doi.org/10.1016/j.ejvs.2018.12.024