A Critical Evaluation of HIPE Data

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Abstract

Resource allocation and planning of future services is dependent on current volumes, making it imperative that procedural data is accurately recorded. We sought to evaluate the effectiveness of the information gathered by the Hospital Inpatient Enquiry (HIPE) system in recording such activity. Five index vascular procedures (open/endovascular abdominal aortic aneurysm repair; endovascular carotid endarterectomy, lower limb angioplasty/bypass) were chosen to reflect the structure of cancer services in this country. Whilst vascular services worldwide are not currently subject to the same level of scrutiny as oncology, similar moves are beginning in the United States where insurance companies are refusing to fund institutions performing less than the requisite number of aortic aneurysms per year - the Leapfrog Initiative. In this information age, a better informed public is demanding rigorous standards of the medical profession which will necessitate a more professional approach to data collection.

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Introduction

Accurate audit is the cornerstone of effective surgical practice. The logging of procedural trends, education and training, and the planning of future service needs are entirely dependent on the collection and analysis of accurate data. The process and endpoints of data collection have taken on renewed importance in recent years in the wake of high profile cases of medical error, and the subsequent demonstration that high case volume is essential for satisfactory outcome. This volume outcome relationship has been proven to hold true in every medical and surgical specialty, and is the principal being used to guide the structure of cancer services in this country. Whilst vascular services worldwide are not currently subject to the same level of scrutiny as oncology, similar moves are beginning in the United States where insurance companies are refusing to fund institutions performing less than the requisite number of aortic aneurysms per year - the Leapfrog Initiative. In this information age, a better informed public is demanding rigorous standards of the medical profession which will necessitate a more professional approach to data collection.

A natural database of vascular procedures does not yet exist in Ireland. The existing approach to data collection is that the Hospital Inpatient Enquiry Scheme (HIPE) collects clinical, demographic and administrative data locally at hospitals. A treatment and investigative summary is created by the medical team prior to the patients discharge. The information contained within this summary is then coded and stored by the HIPE system at the time of the patients discharge from hospital, or death. This data is then exported on a monthly basis to the Economic and Social Research Institute (ESRI). All acute hospitals nationally are compelled to contribute to this database, which is held and maintained in conjunction with the Health Service Executive (HSE). In St. James's hospital we have been using a purpose designed vascular database for over 15 years (Vascubase). A treatment and investigative database is maintained prospectively by the operating surgeons, and records patient investigations and operative details as well as long-term follow up details. The information is entered in real time by the clinical team and is updated regularly as new test results become available. Specific procedural information, as well as trends, is available immediately as well as being easily accessible from remote locations.

To test the validity and accuracy of the present collection systems, we compared data recorded on our department database to the hospital HIPE system for 2005, 2006 and 2009. To examine trends on a regional level, we also obtained HIPE/ESRI data for the Dublin Mid-Leinster HSE region for 2005 and 2006 (of which St. James's, St. Vincent's and AMNCH hospitals are the contributing vascular units).

Methods

Five index vascular procedures were chosen to reflect the spread of vascular activity (carotid endarterectomy (CEA), open aortic aneurysm repair, endovascular aortic aneurysm repair (EVAR), infrainguinal arterial bypass and peripheral angioplasty (including iliac artery angioplasty and stenting)). The 2-year period 2005 and 2006 was chosen because 2006 is the most recent year for which regional data is available (data requested in October 2006), and in 2005 data changed from ICD-9 to ICD-10 coding. The HIPE department in St James's hospital was given a list of ICD-10 codes corresponding to any possible permutations of the 5 index procedures. Three of the index vascular procedures were then interrogated on a case by case basis to identify where any discrepancies between the data sets existed. A similar exercise was also done for 2006 as we were informed that some of the problems we encountered with the 2006 data had been rectified. The ESRI were given the same codes and they provided regional data rather than hospital-specific data, as unit-specific data is confidential to the units concerned. The information obtained from the ESRI database was then compared with the data obtained from the HIPE and our department databases.

Results

The HIPE, department and regional data are shown in Table 1. For each of the 5 index vascular procedures, significant discrepancies exist between the information held by the hospital (St. James's HIPE) and our own procedural database. In most cases, the HIPE system reported a larger volume of procedures, the over-estimation sometimes being as much as 140% (in the case of infra-inguinal bypasses in 2006, range -57% to +140%).
The data becomes even more worrying when we compare case by case data. These results are illustrated in tables 2-4. When one looks at EVAR for 2005 both systems record 31 cases but when one examines case by case only 22 cases (70%) concur. There are an additional nine cases recorded on VascuBase (that are not reflected in the data held by HIPE). The nine extra cases recorded by HIPE are duplicates in 5 instances, 2 patients had open repair rather than EVAR, one patient had a thoracic repair and one patient an iliac aneurysm repair.

The complete match of data was also very poor when assessing CEA and infra-inguinal bypass procedures, falling as low as 25% for Infrainguinal bypass in 2006. These discrepancies highlight that no system is 100% accurate, but the errors seen with HIPE data are unacceptable especially when this data is used for national and regional trends.
and funding by Government. Conversion to open aneurysm repair during the performance of EVAR, because of unexpected complications with the device or hostile anatomy, is a recognized and not uncommon occurrence. Lack of familiarity with common variations in practice such as this may account for some of the discrepancies seen with the EVAR data (Table 3). The endovascular era also sometimes necessitates the performance of additional tasks, such as operating on or stenting the iliac vessels to gain access to the aneurysm, common procedures that were again miss-coded in the EVAR dataset. Nomenclature difficulties, especially with the recent advent of carotid stenting (CAS7), complicated the CEA data (Table 2).

While there was an improvement in the overall matching of data for 2009 there were still too many errors to make data acceptable. Although data for other vascular units was unavailable, the errors seen with our own hospitals figures are likely to be reflected on a regional and national level. Using EVAR figures for 2005 as an example, 31 cases are recorded for St James by HIPE, whilst the ESRI records 34 for the entire region, an unlikely situation given that both other hospitals in the Dublin mid Leinster area also perform EVAR and have done much more than 3 cases for that time period (Table 1).

Discussion

This study demonstrates considerable discrepancy between the hospital administrative data, and our own procedural database, for each of the five index vascular procedures. Of perhaps greater importance is the fact that even where procedures counts appear to tally, the patient details are at wide variance, questioning the accuracy of all the data. When patients are discharged a discharge summary is generated, often by the most junior member of the clinical team. This information then goes to the coding office for dedicated staff to wade through and classify. Given the complexity of surgical procedures, and the many permutations contained within ICD-10, it is impossible for coders to accurately classify the information contained within the discharge summary without a more thorough understanding of the operative procedures being coded. In our comparison there were many reasons for inaccurate data including; duplication, admission for proposed procedures that were then not carried out, wrong anatomical site to name but a few.

Discrepancies between administrative and procedural databases are not unique to Ireland. In a paper published in 2007 Aylin et al by comparing data from the Hospital Episode Statistics (an administrative database held within the United Kingdom, analogous to HIPE) and the data held by the National Vascular Database (a clinical database containing information on index vascular procedures submitted from contributing units). The authors identified significant differences in procedure counts between the two data sets, even when controlling for whether or not all trusts and surgeons contributed data. The data discrepancy highlighted in our study is shocking and it is imperative that ways of improving data collection are identified. To begin with, senior clinicians must buy into the importance of prospective data collection, and contributors must have ownership of their own data if any system is going to work. Additionally, we would suggest that coders spend a period of attachment to clinical teams and accompany them on weekly ward rounds to achieve a greater understanding of the surgical process. This may yield a familiarity with the type of procedures performed, the reason for common permutations, and complications (and deviations from) arising from the surgical pathway, all of which should result in improved data collection. Furthermore, the quality of the information fed into the system by the clinical team should be independently audited on a regular basis, and results fed back to the senior consultants.

In an era of increased public, hospital and fiscal scrutiny, the medical profession is being subjected to profound change. We contend that the provision of accurate data is essential to determine current surgical practice, and future planning for service needs. This study shows the inadequacy of an administrative database for these purposes, and furthermore suggests that any attempt to use such data for service planning is flawed. A database should be maintained prospectively and ideally data should be entered and controlled by the clinical team with review of accuracy built into the data capture mechanism. This will require dedicated funding and personnel, but the benefit of reliable data outweigh these concerns and will allow accurate planning for current and future needs. Concurrently, efforts need to be continually made to detect complications, including those occurring after discharge and so databases of the future will need input from the patients primary care team also.

Furthermore HIPE data is not available on an ongoing current basis and is only available in arrears. This, in our opinion, is a major drawback of this computerized system and ways to have be explored of making data collection current. This data should, and needs to, be available immediately following discharge. If that is possible, then we have the capacity of actually having a robust system that can be used for National Audit that is common to all. Regrettably the current system is fundamentally flawed in many ways and this paper strongly reinforces the need for a properly funded, resourced, and audited National database.

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