How to write a case report

This article briefly looks at the reasons for, and mechanics of, writing case reports and case series for publication. The authors argue for the importance of this narrative form of medical knowledge in the development of clinical reasoning skills.

Before the 'how to do it', it is necessary to ask the question: why do it? Case reports and case series constitute the lowest rung in the hierarchy of clinical evidence, for which reason they are derided in some quarters as mere anecdote. Indeed some journals in which they were once a staple have abandoned publishing them altogether while, on the other hand, some online journals devoted exclusively to the publication of case reports have started up in recent years. So are there any reasons why we should continue to write case reports? Our answer is an emphatic yes (perhaps to be anticipated, since one of us has published at least one case report every year since 1988), based on a number of arguments (Simpson and Griggs, 1985; Vandenbroucke, 2001; Miller and Linssen, 2013), not merely that this is a 'rite of passage' for junior doctors wishing to ascend the clinical hierarchy:

- Awareness raising: a well-presented and plausibly argued case report can highlight specific learning points in diagnosis, investigation and management, and hence fulfil an important role in medical education, fostering the skills of clinical judgement
- Cognitive purpose. Very occasionally case reports present a hitherto undescribed entity and so advance medical knowledge: the written history of Parkinson's disease started with a series of six cases, three observed only in passing, using a so-called 'street watch methodology' (Parkinson, 2010); the written history of Alzheimer's disease began with the clinicopathological report of a single case (Alzheimer, 1907)
- Case reports may be used as arguments for proof of concept or, more plausibly based on the philosophical perspective of Karl Popper (1902–94), refutation of concept. Exceptions to the expected may challenge widely accepted clinical diagnostic criteria (Ali et al, 2013)
- Case reports may (as even proponents of evidence-based medicine acknowledge) act as hypothesis generators, a preliminary datum identifying problems to which research methodology can be subsequently applied. Case reports of suspected adverse drug reactions can be an important signal to prompt more systematic studies (Eke et al, 1997)
- Narrative of individual cases ('Doctors' stories': Hunter, 1991) is the idiom of clinical practice: it is what we attend to every working day.

In addition to these arguments, it may also be worth considering case reports from the perspective of medical history: case reports and series may be seen as descendants emanating from the tradition of the consilia of the physicians of past centuries, in that both are examples of written texts responding to the particular case, offering practical clinical advice based on experiential observations.

This article proffers some heuristic suggestions on how to go about preparing a case report or case series for publication (with the important proviso that these suggestions are not claimed in any way to guarantee success!), since this is a topic which does not generally feature in medical curricula. Some illustrations from the authors' particular sphere of interest, neurology, are given, many published in this journal, although similar arguments can assuredly be made for other clinical disciplines.

How to report cases?

Case selection is crucial: the key point is to identify the message you wish to convey, preferably before you write anything. To borrow from Marshall McLuhan (1911–80), when it comes to case reports the medium is the message, as exemplified in 'Lesson of the Week/Month' columns in some journals.

If possible, identify your target journal early on (senior clinicians with experience of publication may be helpful in providing advice on this point) and adhere to its guidelines for authors with respect to word count, figures and references. Editors may be irritated by failure to comply with these guidelines and increasingly papers may be returned to authors without being sent for peer review if they are not adhered to. Many journals now require signed patient consent forms at initial manuscript submission, not after acceptance, so it is best to acquire these early on, before the patient is lost to follow up. Some journals, especially online publications, require a fee, often several hundred euros, for handling and publishing open access papers, so be aware of this and identify a reliable source of funding before you submit to them.

What cases to report?

While highly unusual cases (so-called 'fascinomas') may merit publication, they may be of limited heuristic value since the lessons to be drawn from them may not be eas-

Dr M Ghadiri-Sani *is Specialist Registrar in Neurology and* **Dr AJ Larner** *is Consultant Neurologist in the Cognitive Function Clinic, Walton Centre for Neurology and Neurosurgery, Liverpool L9 7LJ*

Correspondence to: Dr AJ Larner (a.larner@thewaltoncentre.nhs.uk)

ily generalized. Probably of more value, and hence having a greater chance of acceptance for publication, are cases detailing unusual features in common diseases (Ramtahal and Larner, 2008) since awareness of the possible presentation of the underlying condition may thereby be increased; such variant cases may go under the rubric of 'broadening the phenotype' (Doran et al, 2005; Ghadiri-Sani et al, 2013a).

Reports which illuminate differential diagnosis have obvious teaching relevance (Smithson and Larner, 2013), and cases with initial diagnostic mistakes ('mea culpa') or misapprehensions can be particularly instructive, as well as chastening (Larner, 2004). Illustrations of the clinical-anatomical methodology are much loved by neurologists, often now in the form of clinicoradiological correlations (Larner et al, 1997; Ghadiri-Sani et al, 2013b; Larner, 2013) as opposed to clinicopathological studies which often take much longer to reach diagnostic fruition (Menon et al, 2011; Ali et al, 2013). Cases which reflect advances in the understanding of specific disorders, sometimes resulting in the deployment of new treatments (Sells and Larner, 2011), are also potential fodder, as are therapeutic dilemmas which may illustrate deficiencies in the existing evidence base (Larner et al, 2003). Prolonged follow-up of cases (ideally decades: Larner and Jacob, 2010; Aji et al, 2012), particularly if they have been previously reported in the literature (Larner et al, 1994; Rawle and Larner, 2013), may also be a productive field.

Structuring the case report

Most case reports by convention follow a fairly standardized structure, a fixed regularity which befits this narrative genre (Hunter, 1991). Each element of this is now considered in turn.

Title

This requires some careful thought. As we live in an 'attention economy', with many demands upon these limited resources, the title may be all that the potential reader initially encounters. Accordingly, if you wish to be read, a short, pithy (Ramtahal and Larner, 2009), catchy (alliterative?), intriguing title (Larner, 2011a) which summarizes the report or its message (Larner 2010), even to the point of acting as an adage, may be deemed highly desirable, whereas 'A case of such-and-such a disease' may act as a turn off, giving the diagnostic game away at the outset. Interrogatives may also pique a reader's curiosity to pursue matters further (Larner and Thomas, 2000; Larner, 2007; Ramtahal and Larner, 2009; Menon et al, 2011).

Abstract

Some, but not all, journals require an abstract for case reports, not least for indexing purposes. However, this does tell, albeit in abbreviated form, the story and removes all possibility of the suspense which an unabstracted case report can build in its movement toward the diagnostic denouement.

Introduction

This presents the background, setting the scene by relating what is already known, or in other words contextualizing the case. This should be brief: an exhaustive literature review is not required. The reader should be left wanting more. It is desirable to conclude this section by briefly stating the aim(s) or objective(s) of the report.

Case report(s)

This is the meat of the piece, presenting the (anonymised) history, examination and investigation findings, or in other words the clinical narrative. Since case data may have been gathered in a rather piecemeal, haphazard way, depending on how the clinical scenario played out (and of course unlike the systematic data collection of clinical trials), it may appear difficult to tell a clearly evolving and coherent story. This is where the art of case reporting becomes most apparent: this is, after all, a construct which attempts an interpretive reconstruction of the actual case. There should be a rigorous pruning of all extraneous material, aside from a few judicious negatives. Specific dates should be avoided: it is better to give times from the onset of symptoms (e.g. '3 months later'), in other words information should be presented chronologically. Failure to observe internal consistency in the case reportage will invite rejection.

Discussion

This should briefly summarize the particular case presented, and then contextualize it in the light of other similar cases, and state clearly the 'take home' lesson(s) or message(s) to be learned from this case, perhaps in the form of recommendations for practice.

References

The citations will generally be focused rather than exhaustive, since there are often strictures on the number of references which may be cited. Note the particular reference style of your chosen journal and adhere to it.

Pragmatic considerations

Although writing up a case report or series may seem a straightforward proposition at the outset, this is not necessarily true. On occasion the pathway from idea to published article is smooth and brief (months), but often the road is bumpy and publication may easily take a year or more. Some journals have long delays even between acceptance and publication (our record is approaching 2 years, and counting), although articles may be available sooner on-line. Case reporting is not necessarily a speedy route to augmentation of your CV!

Even if the case notes are to hand, and the message to be conveyed is obvious from the outset, beginning the writing process, the challenge of the blank page, can be

daunting for some would-be authors, however fluent they may be with the spoken word. Clarity of written presentation may not be immediately forthcoming, and more than one draft of the manuscript may be required before submission.

Dependent upon the complexity of the case and the involvement of other clinicians, the number of co-authors may expand, all of whom will need to make some contribution to and read the final manuscript. This factor may slow progress: as the number of co-authors increases as an arithmetic progression, the time taken to finalize the submission may seem to increase as a geometric progression (one of us has experience of a senior co-author taking more than a year to getting around to reading a manuscript, and then having essentially nothing to contribute to it). Would-be 'authors' may unexpectedly emerge from the woodwork as it becomes apparent that publication is a possibility, not having been previously apparent to do any of the work, at which point it may be sensible to consult the criteria for authorship enunciated by the International Committee of Medical Journal Editors (2013). In short these recommend that authorship be based on the following four criteria:

- Substantial contributions to the conception or design, or acquisition, analysis or interpretation of data
- Drafting or revising the work for important intellectual content
- Final approval of the version to be published
- Agreement to be accountable for all aspects of the work.

Once submitted, rejection of the manuscript is a possibility to be anticipated, an event which, however initially galling, should be handled philosophically (there is more than one journal in the world which may be interested in publishing your work, and sometimes papers end up in better journals having been rejected elsewhere). Although reviewer comments often appear crass or wilfully obtuse, suggesting they have either not read or not understood the manuscript, there may sometimes be a useful suggestion which might facilitate later acceptance and should therefore be adopted if possible.

Resilience, a determination to battle on, sometimes amounting to bloody-mindedness, may be required. If you have invested effort in writing something up, then abandoning it might represent a waste of time, although most experienced authors will have consigned at least one proposed case report to the dustbin of history because of its unsuitability for publication (hence the critical importance of case selection mentioned previously). Acceptance is, of course, a joy (albeit often transient) and seeing one's name in print may give the impression that you are making a contribution, however miniscule, to medical knowledge.

Discussion

The epistemological importance of narrative in clinical medicine is undisputed, hence the importance of case reports as a pedagogical and heuristic device (Hunter, 1991). Lest anyone should be too dismissive of this link between literature (rather than science) and medicine, it is well recognized that the narrative description of disease in individual patients (the medical case) evolved at about the same time in the nineteenth century as detective fiction, both examples of case-based inquiry (Hunter, 1991; Kempster and Lees, 2013). It is no coincidence that the methodology of Sherlock Holmes – a literary character created by a clinician, Arthur Conan Doyle (1859–1930), and based on his experience of Dr Joseph Bell (1837–1911), an Edinburgh physician (Larner, 2011b) – namely: 'the retrospective construction of a hypothetical narrative in order to work out the relation of the clues to one another within an acceptable chronology' (Hunter, 1991), remains applicable in clinical practice and in the formulation of case reports.

As Soren Kierkegaard (1813–55) famously pointed out: 'Life can only be understood backwards; but it must be lived forwards', a dictum which may underpin Holmes' reasoning backwards from effect to cause. The case report exemplifies this in many ways: the clinical scenario which may initially have baffled the clinician is retrospectively reported as a seemingly linear progression to diagnosis. The medical interpretation of the patient history creates a metastory of illness which facilitates understanding and, hopefully, treatment.

For these reasons, far from belittling the writing of case reports, we believe this is a skill which should be encouraged in all clinicians. **BJHM**

Conflict of interest: none.

KEY POINTS

- Although dismissed by some as anecdote, case reports in fact reflect the idiom of clinical medicine: focusing the clinical gaze on the individual patient.
- Although not all cases are worthy of being written up, there are a number of reasons for seeking case publication, not least as a teaching resource.
- Case selection is critical: seek advice from a senior clinician with experience of the process on matters of the key message and suitable journal.
- Once a target journal is identified, following the rubric to the letter.
- If rejected, be persistent: if the case and its message is good enough, it will get published!

Aji BM, Ghadiali EJ, Jacob A, Larner AJ (2012) Passage of an iron bar through the head: 50-year follow-up. *J Neurol* **259**: 1247–8

Ali R, Barborie A, Larner AJ, White RP (2013) Psychiatric presentation of sporadic Creutzfeldt-Jakob disease: a challenge to current diagnostic criteria. *J Neuropsychiatry Clinical Neurosci* **25**: 335–8

Alzheimer A (1907) Über eine eigenartige Erkrankung der Hirnrinde. *Allgemeine Zeitschrift fur Psychiatrie und Psychisch-Gerichtlich Medizine* **64**: 146–8

Doran M, Enevoldson TP, Ghadiali EJ, Larner AJ (2005) Mills syndrome with dementia: broadening the phenotype of FTD/MND. *J Neurol* **252**: 846–7

Eke T, Talbot JF, Lawden MC (1997) Severe persistent visual field constriction associated with vigabatrin. *BMJ* **314**: 180–1

Ghadiri-Sani M, Waqar M, Smith D, Doran M (2013a) Paraneoplastic neurological syndromes: severe neurological symptoms resulting from relatively benign or occult tumours – two case reports. *Case Rep Oncol Med* **2013**: 458378

Ghadiri-Sani M, Dougan C, Lecky B (2013b) Slowly progressive upper limb weakness: two cases of Hirayama disease and review of literature. *J Neurol Neurosurg Psychiatry* **84**: e2

Hunter KM (1991) *Doctors' stories. The narrative structure of medical knowledge.* Princeton University Press, Princeton

International Committee of Medical Journal Editors (2013) Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals: Roles and Responsibilities of Authors, Contributors, Reviewers, Editors, Publishers, and Owners: Defining the Role of Authors and Contributors. www.icmje.org/roles_a.html (accessed 16 January 2014)

Kempster PA, Lees AJ (2013) Neurology and detective writing. *Pract Neurol* **13**: 372–6

Larner AJ (2004) Getting it wrong: the clinical misdiagnosis of Alzheimer's disease. *Int J Clin Pract* **58**: 1092–4

Larner AJ (2007) Braille alexia: an apperceptive tactile agnosia? *J Neurol Neurosurg Psychiatry* **78**: 907–8

Larner AJ (2010) Pitfalls in the diagnosis of ulnar neuropathy: remember the deep palmar branch. *Br J Hosp Med* **71**: 654–5

Larner AJ (2011a) Amnesia as a sex-related adverse event. *Br J Hosp Med* **72**: 292–3

Larner AJ (2011b) 'Neurological literature': Sherlock Holmes and neurology. *Adv Clin Neurosci Rehabil* **11**(1): 20, 22

Larner AJ (2013) Cerebral mass lesions presenting in a cognitive disorders clinic. *Br J Hosp Med* **74**: 694–5

Larner AJ, Jacob A (2010) Paroxysmal exercise-induced dystonia with optic atrophy: 30-year follow-up. *Neurol India* **58**: 135–6

Larner AJ, Thomas DJ (2000) Can myasthenia gravis be diagnosed with the 'ice pack test'? A cautionary note. *Postgrad Med J* **76**: 162–3

Larner AJ, Moss J, Rossi ML, Anderson M (1994) Congenital insensitivity to pain: a 20 year follow up. *J Neurol Neurosurg Psychiatry* **57**: 973–4

Larner AJ, Zeman AZJ, Antoun NM, Allen CMC (1997) MRI appearances in subacute combined degeneration of the spinal cord due to vitamin B12 deficiency. *J Neurol Neurosurg Psychiatry* **62**: 99–100

Larner AJ, Rose EL, Humphrey PRD (2003) A therapeutic dilemma: atrial fibrillation, transient ischaemic attacks, and an unruptured intracranial aneurysm. *Hosp Med* **64**: 52–3

Menon R, Baborie A, Jaros E, Mann DMA, Ray PS, Larner AJ (2011) What's in a name? Neuronal intermediate filament inclusion disease (NIFID), frontotemporal lobar degeneration-intermediate filament (FTLD-IF) or frontotemporal lobar degeneration-fused in sarcoma (FTLD-FUS)? *J Neurol Neurosurg Psychiatry* **82**: 1412–14

Miller R, Linssen R (2013) The value of case reports in medical education. *Br J Hosp Med* **74**: 666

Parkinson J (2010) *An Essay on the Shaking Palsy 1817.* Wiley-Blackwell, Chichester

Ramtahal J, Larner AJ (2008) Diagnosing multiple sclerosis: expect the unexpected. *Br J Hosp Med* **69**: 230

Ramtahal J, Larner AJ (2009) Shaky legs? Think POT! *Age Ageing* **38**: 352–3

Rawle MJ, Larner AJ (2013) NARP syndrome: a 20-year follow-up. *Case Rep Neurol* **5**: 204–7

Sells RAD, Larner AJ (2011) From symptoms to causes: progress in the treatment of neurological disease. *Br J Hosp Med* **72**: 350–1

Simpson RJ Jr, Griggs TR (1985) Case reports and medical progress. *Perspect Biol Med* **28**: 402–6

Smithson E, Larner AJ (2013) Glioblastoma multiforme masquerading as herpes simplex encephalitis. *Br J Hosp Med* **74**: 52–3

Vandenbroucke JP (2001) In defense of case reports and case series. *Ann Intern Med* **134**: 330–4