Case Reporting as a Macro-genre and its Metadiscoursal Aspects – A Review of the Literature

Magda Żelazowska-Sobczyk
University of Warsaw

Magdalena Zabielska
Adam Mickiewicz University

Abstract
This paper is an attempt to present and systematize knowledge of the varieties of case reporting, and to compare them in terms of their structure, language features, and their rhetorical functions following the metadiscourse approach by Hyland (2000, 2005, with Tse 2004). The theoretical part of this paper includes a definition and characteristic features of the genre, a brief historical background, descriptions of case report varieties (e.g. evidence-based CR, integrated narrative and evidence-based CR, interactive CR, *Patient Experience Case Studies*, educational CR and brief CR), their structure, and a review of the literature. The empirical part presents an analysis of a collection of English case reports from prestigious scientific medical journals – *American Journal of Case Reports*, *British Medical Journal*, *Case Reports in Medicine*, *Journal of Case Reports*, *Journal of Medical Case Reports*, *The Lancet*, and one Polish journal (in English) – *Polish Journal of Surgery*, and concerns their structural, linguistic and rhetorical aspects.

Keywords: medical communication, scientific writing, case report, metadiscourse, patient

Abstrakt

Celem pracy jest przedstawienie i usystematyzowanie wiedzy o opisach przypadków i ich odmianach, porównując ich budowę, cechy językowe i struktury retoryczne w oparciu o model metadyskursu Hylanda (2000, 2005, razem z Tse 2004). Część teoretyczna zawiera definicję i cechy charakterystyczne tegoż gatunku, perspektywę historyczną oraz opis nowych odmian pisarstwa opisowego (np. opis oparty na faktach, wersję opisu opartego na faktach w połączeniu z subiektywnymi relacjami lekarza i pacjenta, opis interaktywny, projekt *Patient Experience Case Studies*, opisy o charakterze dydaktycznym oraz formy skrótowe), ich strukturę i przegląd badań. Część empiryczną stanowi analiza anglojęzycznych opisów przypadków z prestiżowych czasopism medycznych, takich jak *American Journal of Case Reports*, *British Medical Journal*, *Case Reports in Medicine*, *Journal of Case Reports*, *Journal of Medical Case Reports*, *The Lancet*, oraz jednego czasopisma polskiego (jednak tylko artykuły w języku angielskim) – *Polish Journal of Surgery*. W badaniu zostały wykazane cechy lingwistyczno-retoryczne, obecne w analizowanych opisach przypadków, a także ich struktura.

Słowa kluczowe: komunikacja medyczna, tekst naukowy, opis przypadku, metadyskurs, pacjent

1. Aim

The aim of this study is an attempt to systematize knowledge of the varieties of medical case reports (henceforth CR) (traditional CR, evidence-based CR, integrated narrative and evidence based CR, interactive CR, *Patient Experience Case Studies* and new varieties of CR: educational CR, e.g., "Case challenges", "Lesson of the week", medical/clinical images, flashlights, etc.) with respect to their structure as well as linguistic and rhetorical features. The paper begins with the theoretical part, which includes the definition of the genre, characteristic features of the structure of the CR, a brief historical outline and a description of the varieties of CRs. In this way, it constitutes a review of the literature on case reporting from the perspective of different disciplines: linguistics, health sciences, medical education, medical ethics, etc. Research data in the empirical part consist of case reports in English derived from prestigious scientific journals: *American Journal*

of Case Reports, *British Medical Journal*, *Case Reports in Medicine*, *Journal of Case Reports*, *Journal of Medical Case Reports*, *The Lancet*, and from one Polish journal (in English) – *Polish Journal of Surgery*. The results of a comparative analysis of the texts point to characteristic features, similarities and differences among the varieties of the case report.

2. Theoretical background

The case report is one of the many representatives of specialized texts in scientific discourse, which is addressed to doctors, students of medical faculties and beginners in the healthcare system. As Green and Johnson (2006, 73) notice, case reports describe: (1) unusual or unknown disease, (2) unusual etiology for a case, (3) new insight into pathogenesis of a disease, (4) unusual or puzzling clinical features, (5) challenging differential and innovative diagnosis, (6) mistakes in healthcare, in diagnostic and treatment process, (7) improved or unique technical procedures, (8) unusual drug-drug, drug-food, or drug-nutrient interactions, (9) rare or novel adverse reaction to care, (10) unusual setting for care, (11) way of how to study the mechanism of a disease, (12) new clinical hypothesis, (13) reason for carrying out further research, (14) original contribution to the literature, and (15) historical development of a field or movement. Gopikrishna (2010, 266) adds to the list (16) an unreported case of association of two diseases, and possible relationship between them. According Nissen and Wynn (2012, 87), the case report is "a detailed description of the experience of a single patient" and "a formal summary of (...) his or her illness, including the presenting signs and symptoms, diagnostic studies, treatment course and outcome". Therefore, it can be said that "[a]ny patient that goes through the door of [a] hospital is a potential case report" (Anonymous, in Jenicek 2001, V). It is worth noticing that the main advantage of the CR is "the accessible nature of this particular of clinical information" (Gopikrishna 2010, 265), which may help to find quickly a more effective solution to similar clinical problems in the future. In addition to the above, the case report has also an educational value (Cabán-Martinez and Gracia-Beltrán 2012), and writing it up is often the first scientific activity among medical students and young doctors since it is "a vehicle for teaching clinical medicine" (Jenicek 2001, XII).

More generally, case reports belong to the so-called *macro-genre* (Martin 1995, 16) featuring "familiar elemental genres" of the CR (Martin 2000, 16): case reports, case records/histories, case notes and case presentations, which allow professionals across

institutions to construct and manage cases (Sarangi and Brookes-Howell 2006, 197). Other types of case reporting (both oral and written) include: floor or daily ward presentations, presentations on rounds, progress reports, including morning or admission reports and discharge summaries, brief reports, a case to learn from (educational purpose) and the CR for non-medical purposes (compensation claims in occupational medicine and tort litigations) (Jenicek 2001, 5–6, 69–70, 97). Although the contexts of their production and use may differ, rhetorically, they are all "descriptive and expository" (Salager-Meyer et al. 1989, 155). As regards the case report specifically, the literature and medical databases (for instance, PubMed, Scopus, Web of Science, Google Scholar) use a variety of different names for the CR: clinical case report, single case report, single-patient case report, rare case report, report of a case and case series, case series report, report of case series, etc. Case series include 3–10 cases of a disease (Nissen and Wynn 2012, 87).

3. Brief historical background

The case report is the oldest and the most grounded way of communication in medicine as first CRs come from Ancient Egypt (Dib, Kidd, and Saltman 2008, 1). Probably the oldest and most well-known is the Edwin Smith Papyrus (1600 BC). A significant impact on case reporting development was also exerted by Greek physician Hippocrates (400 BC), the author of Hippocratic Corpus, consisting of several case narratives. In his case histories, a physician-narrator played the most important role and the patient's own version was intentionally omitted (Nissen and Wynn 2014, 1–2). Claudius Galenus (200 AD), Greek physician in the Roman Empire, also authored many case histories. In Islamic Middle East medicine CRs were developed by Razi (approximately 925 AD), who is believed to be the author of about 1000 case histories, included in *Casebook* (Álvarez-Millán 2000, 2015).

For ages CRs were regarded as the primary way of communication among physicians – as a regular talk or a written note – about an unusual or interesting patient in their everyday practice. This form of informal communication evolved into one of the representatives of academic discourse (Carleton and Webb 2012, 93). Yet, with the rapid development of medical research and practice, it was relegated to the role of teaching material in education or an article about "precious gems" (Papanas and Lazarides 2008, 344) due to the introduction of innovatory diagnostic and treatment methods as well as

the popularization of a new approach in medicine – evidence-based medicine (EBM). According to Jenicek (2001, 23, 212), EBM is "the process of systematically finding, appraising, and using contemporaneous research findings as the basis for clinical decision; the application of valid information to answer the clinical question; patient care based on evidence derived from the best available studies".

In the 1980s, EBM had a significant impact on the publication of CRs in that a number of scientific medical journals relegated them to the "Letters to the editor" section (Nissen and Wynn 2012, 2). After 1990 the case reporting genre regained its former position and prestige. As a consequence, many journals created new sections only for publishing CRs. In 1995 *The Lancet* introduced a new section, called "Case reports", while in 1997 the *American Journal of Psychiatry* introduced the "Clinical case conference" section. In 1999 Browman in the *Journal of Clinical Oncology* proved that it is possible to focus on the patient and their preferences and emotions in tumor treatment even if they are incompatible with the EBM approach. Furthermore, numerous journals were established only to focus on the publishing of case reports, for instance, *BMJ Case Reports*, *Case Reports and Clinical Practice Review*, *Case Reports in Dermatology*, *Case Reports in Medicine*, *Case Reports in Ophthalmology*, *American Journal of Ophthalmology Case Reports*, *Case Reports in Ophthalmology Medicine*, *Clinical Case Reports*, etc. Since 2007, due to the establishment of the *BMJ Case Reports* and the *International Journal of Surgery Case Reports* as open-access resources, countless CRs have been published on-line (Nissen and Wynn 2012, 87–90). A renewed interest in the case reporting genre as well as changes in doctor-patient communication have contributed to the creation of new varieties of CRs: evidence-based CR, integrated narrative and evidence CR, interactive CR, *Patient Experience Case Studies*, and educational CRs, such as "Case challenge", "Lesson of the week", letters to the editor with case stories, and brief stories such as "Clinical vignette", "Clinical photograph", flashlights, etc.

As Nissen and Wynn (2014) notice, the end of twentieth century was important for the changing role of CRs for two reasons. First of all, the narrative approach offered a new perspective on case reports as stories of individual people (Barusch 2012). Secondly, the potential of case reports to highlight the patient's perspective was emphasized, in light of the patient-centered model, which resulted in many case-related publishing initiatives (see subsection 6.3 below).

4. Varieties of medical case reports

4.1. Traditional CR

A traditional case report has a canonical structure including: (1) "Introduction", consisting of historical background, aim of the report and importance of the problem (frequency of previous cases, disease, time frame and location) and a brief review of the literature; (2) "Case report" (or "Presentation of the case"), consisting of doctor interview, history of the disease and family record, diagnostic tests and results, treatments and rehabilitation; (3) "Discussion", featuring analyses of present results and their comparison with previous research as well as evaluation of case uniqueness; and (4) "Conclusion", including brief summary, own research experience as well as recommendations for the treatment of similar cases and for further research (Jenicek 2001, 100–129; Gopikrishna 2010, 266–270).

However, while traditional CRs have been more common in scientific literature, new variations are constantly being introduced.

4.2. Evidence-based CR

The first type of the CR macro-genre is the evidence-based case report (EBCR), following the evidence-based medicine approach (see section 3 above). The EBCR was launched in 1998 in the *British Medical Journal* to "help readers develop the increasingly necessary art of using research evidence in practice" (Godlee 1998, 1621; Nissen and Wynn 2012, 88). Jenicek (2001, 211) describes the EBCR as "a case report focused on a defined question and its solution based on the evolution of all relevant evidence available for the solution of the case" (Jones-Harris 2003, 75). There are five elements (main points) that characterize a good-quality EBCR: (1) clinical question/hypothesis; (2) looking for evidence for the hypothesis; (3) critical analysis of the evidence as regards its importance and role; (4) decision making process, based on the evidence and clinical experience; as well as (5) treatment progress and taking actions. An EBCR starts from a short presentation of a patient/case and proceeds to three sections: Search (points 1–2), Evidence (points 3–4) and Outcome (point 5).

4.3. Integrated narrative and evidence-based CR

This type of the CR is based on narrative and evidence-based approaches. As Meza and Passerman (2011, 96) notice, "the narrative and the evidence are blended (integrated) by going back to where the patient left off – the narrative dilemma – and showing how the evidence fits within that context; the evidence thus becomes situated and contextualized within the narrative framework". Integrated narrative and EBCRs used to be published in the *British Medical Journal*. Their structure consisted of short stories authored by physicians and patients or a dialogue between them, and information about the case, ways of looking for the solution and a possible solution to the problem. As Reis et al. (2008, 1019) observe, the doctors' subjective perspective may also have an impact on the decision-making process.

4.4. Interactive CR

Interactive CRs were launched in 2003 by the *British Medical Journal* as case series about one topic, consisting of three parts: (1) "Case presentation" (presentation of the case and the disease as well as an invitation for readers to participate in an interactive discussion), (2) "Case progress" (treatment process), and (3) "Case outcome" (summary of the treatment, discussion and recommendations for further studies). The said interactivity of the case report had two goals: inviting readers to a discussion of a topic and achievements; as well as presenting the "Patient's perspective" section at the end of the CR, consisting of a story in the patient's words in the first person singular, about their feelings, experience of the disease, treatment process, etc. It is noteworthy that in other CRs types, the very message of the "Patient's perspective" section is an integral part of the body of the text while in interactive CRs it is located at the end of the publication as a separate section. In interactive CRs this text may also be written by patients themselves or in collaboration with their physicians, or even by physicians. In traditional case reports, as distinct from interactive CRs, the third person narrative is used, highlighting an objective overtone of information about a particular case, obtained while using medical equipment, etc. (Taavitasinen and Pahta 2000, 60). Interactive CRs, on the other hand, adopt the patient-centered approach, which may be described as "a quality of personal, professional, and organizational relationships, when patients are known as persons in context of their own social worlds, listener to, informed, respected, and involved in their care – and their

wishes are honored" (Epstein and Street 2011, 100–1). The project of interactive CRs was eventually ended due to its labor-intensive character, but the idea of interactivity in professional medical publications continues to be recommended.

4.5. "Teaching a case" varieties and brief CRs

Apart from the above-discussed varieties of the case reporting macro-genre, other forms are practiced, with the view to teaching medical students and young doctors to diagnose a disease and make a clinical decision about the treatment process, etc. These are, for instance, on-line "Case challenge" (from medical website *Medscape*), "Lesson of the week" (*British Medical Journal*), "Teaching case of the month" (*Respiratory Care*), "Clinical problem solving" (*Archives of Otolaryngology*), etc., and a new project called *Educational Case Reports in Teaching and Learning Medicine*, launched by dr Anna Cianciolo. Also *Oxford Medical Case Reports* has recently launched its first educational CR.

A separate group of varieties of medical case reporting is also brief CRs, such as, e.g., "Clinical image" (*Oxford Medical Case Reports*), "Clinical photograph" (*Otolaryngology – Head and Neck Surgery*) and "Cardiovascular flashlight" (*European Heart Journal*). Brief CRs, often one-page and non-structured, consist only of important information about a case, diagnostic process, treatment and a follow-up. Some of them include Discussion and/or Conclusion sections (e.g. "Clinical photograph"). Educational CRs often have a quiz-form with the question about a diagnosis and a hyperlink to the video where information about the correct diagnosis of the case and its definition, historical background, frequency, treatment methods, etc. can be found (e.g., "Clinical problem solving", cf. Żelazowska and Zabielska 2016).

4.6. Patient Experience Case Studies

Patient First Review was a project conducted in the province of Saskatchewan in Canada in 2009 in order to answer the question: "Is this the best we can do?" (KPMG 2009, 1). In other words, its aim was to increase the quality of healthcare offered there. As it was originally formulated, "[p]lacing patients first adds important dimensions to how we judge the success or failure of the health care system. [...] By putting patients first, we heard the healthcare system judged not in terms of productivity or efficiency or even clinical

outcomes, but in terms of pain, suffering, worry and fear" (KPMG 2009, 2). *Patient Experience Case Studies*, created as part of the project to complement it, were divided into sections: "Introduction" (introduction to the case as well as important information), "Patient's story" (patient's perspective in a third person narrative), "Case discussion" (solution to the problem and consequences of that choice), "Leading practices" (recommended solutions) and "Patient's story retold" (the case retold by a physician). There are three publications of this type available, featuring three different cases, named after the patients – Emma's story, Mathew's story and Walter's story.

5. Review of the literature

The body of research on medical case reporting is, in comparison with studies dealing with other scientific genres, e.g. original research papers, significantly smaller, yet it touches upon a variety of topics. There are studies documenting the development of that genre from a historical viewpoint. In these studies, their authors focus on the evolution of the patient's perspective and his/her presentation, as well as the perception of illness, yet without examining language features (see Reiser 1991; Nowell-Smith 1995; Hurwitz 2006). The question of the patient's perspective has also been the subject of research in papers by Engel (1977), Grice and Kramer-Dahl (1992), Ashcroft (2000), Kenny and Beagan (2004) and by Murawska (2010).

The history of case reporting, present approaches and directions of change have been reviewed by numerous researchers, for instance, Reiser (1991), Álvarez-Millán (2000; 2015), Jenicek (2001), Dib, Kidd and Saltman (2008), and Nissen and Wynn (2012; 2014). Other significant contributions that should be mentioned include: Hunter's book *Doctors' Stories. The Narrative Structure of Medical Knowledge* (1991), which describes in detail the rules for creating each element of that macro-genre, their structure and role, as well as Jenicek's book *Clinical Case Reporting in Evidence-based Medicine* (2001); Atkinson's book *Medical Talk and Medical Work* (1995) more generally describes practices of the production of medical knowledge in the healthcare context, including constructing cases and their everyday presentations. As regards the language features of CRs, they have been dealt with from different perspectives:

a. qualitative analysis of semantic and syntactic features and their roles (Rowley-Jolivet 2007; Méndez-Cendón 2009; Mungra and Canziani 2013),
b. metadiscourse analysis (Adams Smith 1984; Salager-Meyer 2001),

c. diachronic studies of textual references to patients in diagnosis and treatment presentation (Taavitsainen and Pahta 2000),
d. types of titles of CRs (Salager-Meyer and Alcaraz Ariza 2013),
e. Systemic Functional Grammar approach in comparing CRs with literary texts (Francis and Kramer-Dahl 2004),
f. multimodal analysis of the genre in the psychiatric context (Skinner 1956; Berkenkotter 2008),
g. cultural perspective (Coker 2003).

A separate body of research includes works on the educational value and pedagogical purposes of CRs in medical training (Treasure 1995; Pettinari 1998; Garzone 2011; Cabán-Martinez and Gracia-Beltrán 2012; Camp 2013; Jackson et al. 2014; Florek and Dellavalle 2016). Pierson (2004, 2009) studied limitations of and common mistakes in CRs. Researchers have focused also on familial representations of the macro-genre: patient or disease history, medical case note (Burnum 1989; Charon 1992; Donnelly 1992; Sarangi and Brookes-Howell 2006; Siegler 2010) or daily case presentations during rounds (Anspach 1998; Jenicek 2001).

The increasing popularity of case reports has also contributed to an increase in the texts offering guidelines on how to write and publish a good case report. These appear as regular articles, editorials, letters to the editor, comments, etc., and they are intended for established and young doctors as well as medical students. These include Huston and Squires (1996), Iles and Piepho (1996), White (2004), Jenicek (2008a, b), and Rison, Kidd, and Koch (2013) to name but a few.

6. Analysis

6.1. Data and methods

The data under analysis consist of case reports in English from open-access medical journals such as *American Journal of Case Reports*, *Case Reports in Medicine*, *Journal of Case Reports*, *Journal of Medical Case Reports*, *The Lancet*, and one Polish journal (in English) – *Polish Journal of Surgery*. 36 CRs have been selected, including 30 traditional CRs (5 from each journal mentioned above), and 6 varieties of CRs: evidence-based CRs, integrated narrative and evidence based CRs, interactive CRs, all from the *British Medical*

Journal, and *Patient Experience Case Studies* – Mathew's story as a part of *Patient First Review*.

In the present study, the following aspects have been investigated: (a) structure of the traditional CR and its new varieties with examples derived from different parts of the texts; (b) patient's perspective; as well as (c) metadiscourse indicators and grammar structures.

In order to describe the rhetorical structure and role of metadiscourse resources in the CRs, a decision was made to adopt the metadiscourse model by Hyland (2000, 2005, with Tse 2004). Yet, the purpose of the present study has not been to analyze the frequency of metadiscourse indicators in case reporting but rather to demonstrate and illustrate the presence of these structures across the macro-genre.

6.2. Structure of CRs

As mentioned above, a traditional CR is divided into three main sections (see below), and one extra – Conclusion, which describe different aspects of a given case: description of the patient, diagnosis, treatment, present studies, further recommendations, etc.

1. *Introduction*
   a. historical background of the disease
      - *The prevalence of neonatal teeth ranges from 1:700 to 1:30,000*. CR3
      - *It was first described by Moschcowitz in 1925*. CRM23
      - *In Poland from 1998 to 2001, 265 samples of serum were collected from persons with Bartonellosis, and individualistic antibodies for Bartonella henselae were detected in 144 of them*. PPC1
   b. definition of the disease/issue
      - *The term bezoar refers to accumulation/impaction of foreign material in the gastrointestinal tract and is known to occur in human and animals for centuries*. CR1
      - *Granular corneal dystrophy* (*GCD*) *is an autosomal dominant disorder* [...]. CR2
   c. introduction of terminology
      - *Teeth presenting at the time of birth are called natal teeth*. CR3
      - *Jigger, the most common name for Tungiasis, also known as the following: chigoe flea, jigger, pigue, nigua, pico, bicho de pie, bug of the foot, Tunga penetrans, T penetrans*. AJCR39

d. importance of the topic and frequency of occurrence of a given problem
   - *Liver diseases are not considered high in the list of possibilities while dealing a case* [sic!] *of cyanosis and clubbing, particularly if the patient presents for the first time with these features*. CR10
   - *But HPS as the first manifestation of Wilson disease is very unusual*. CR10
   - [...] *sometimes the diagnosis of IE can be very challenging*. CRM27

e. aim of the CR
   - *The objective of this case report is to describe the management of GCD with DALK procedure in young patient*. CR3
   - *We report an unusual case of TTP associated with the use of moxifloxacin* (*Avelox*). CRM23
   - *We present an unreported case of proximal femur osteosarcoma with intra-articular involvement, treated with extra-articular resection of the hip* [...]. CRM34

2. *Case report* (or *Case presentation*)

f. patient presentation
   - *We present a case of a previously healthy 8-year-old boy with a 5-month history of intermittent right hip and knee pain*. CRM34
   - *In October 2011, the authors visited a 46-year-old immigrant Moroccan for the first time*. AJCR14
   - *I.G.* (*history number 1308/06*)*, a woman born on April 6, 1985, was admitted to our clinic for the first time on November 6, 2006*. PPC7

g. medical history
   - *At this point, we reviewed her clinical history but nothing suggestive of liver disease or upper GI hemorrhage was obtained. She never underwent any abdominal operation and denied any addiction*. CR10
   - *Her past medical history was significant for hypertension* [...]. CRM23
   - *He denied history of any recent gastrointestinal or respiratory infections as well*. CRM8

h. family medical record
   - *He told that his young brother had similar symptoms*. CR2
   - *She denied any history of recurrent chest infections in childhood or any history suggestive of cyanotic spells at her school going age. No significant family history was obtained*. CR10

- *The patient did not report any symptoms suggestive of reflux disease in the preceding years. He had no relevant past or family history.* JCR12

i. patient's condition at the admission
   - *On admission, the patient was in normal mental and hemodynamic state.* CRM27
   - *On arrival at Alice Springs Hospital, she was severely dehydrated. Her weight of 6,02 kg was 17% below her maximum recorded 2 months earlier.* LAN12

j. performed tests, results and clinical observation
   - *The incisional biopsy was taken from the lesion and reported to be squamous papilloma.* CR4
   - *Physical examination and laboratory tests* [...] *showed no abnormalities.* LAN1

k. clinical diagnosis
   - *The patient was diagnosed with granular corneal dystrophy* (*GCD*) *of his both eyes and planned for bilateral DALK*. CR2
   - *Our clinical diagnosis was verrucous carcinoma.* CR4

l. limitations of tests, treatment, etc.
   - *Corneal endothelial cell count was difficult to measure due to his corneal haziness.* CR2
   - *No splenomegaly was appreciated, but the examination was limited due to voluntary guarding*. AJCR5
   - *In the above case report, USS and CT were unable to provide a preoperative diagnosis.* JCR12

m. treatment, procedures and rehabilitation process
   - *Patient underwent surgical excision and flap cover in view of large growth.* CR4
   - *A femoral osteotomy was made 16 cm distally from the tip of the greater trochanter, giving 3 cm of wide margin*. CRM34
   - *During the short period* (*15 days*) *of hospitalization in the Infectious Disease Department, the patient was started on a 4-drug regimen of isoniazid, rifampicin, pyrazinamide, and streptomycin.* AJCR14

n. patient after the procedure
   - *In the following days, the patient showed a slight benefit in the articular pain but developed an episode of amaurosis fugax.* CRM27
   - *Patient remained afebrile for the next 72 hours and was discharged to complete a six-week course of antibiotics.* CRM17

- *Following embolization, the patient made a prompt recovery and was subsequently discharged to home without any other sequelae from his infectious process*. AJCR5

o. recommendations
- *The post-surgery course was uneventful and the patient was referred to the psychiatry department for further treatment*. CR1
- *Patient was instructed to attend hematological follow-up and to vaccinate against hepatitis type B and pneumococcal infection*. PPC15

p. follow-up process
- *Three months follow up, showed BCVA at 6/40 by using semihard contact lens*. CR2
- *He is currently undergoing chemotherapy with bendamustine with plans for an allogeneic stem cell transplant. Interestingly, his neurologic symptoms had mostly resolved despite the persistence of his HL*. JMCR18
- *The patient does not report any difficulties with eating. Ambulatory follow-up and rheumatological treatment was continued*. PPC23

3. *Discussion*

q. repetition of the problem and its importance
- *The uniqueness of the case was that the patient presented to the medical facility for the first time with features favoring hypoxia and was ultimately diagnosed to be a case of cirrhosis of liver with a pulmonary vascular complication, namely HPS*. CR10
- *Diabetes mellitus* (*DM*) *is a common chronic condition managed in the community*. CRM8
- *Cat scratch disease is often a rare and ignored illness, but it is important for practitioners to consider because it appears in soft tissues, lymph nodes and even the parotid gland*. PPC1

r. repetition of definition of the disease/main recommendations; causes of the disease and its etiology
- *Wilson disease is an autosomal recessive disorder of systemic copper overload and resultant toxicity*. CR10
- *Endoprosthetic replacement following tumor resection is a good treatment option for proximal femoral malignant lesions*. CRM34
- *Previous studies have identified African-American ethnicity as an independent risk factor for invasive pneumococcal disease with odds ratio of 3.4 in a study by Nuorti et al.* [...]. CRM17

s. review of the literature
   - *DeBakey and Ochsner studied 311 cases of trichobezoar and found that almost 90% occurred in teenage females*. CR1
   - *It was first reported in the West Indies by Duncan et al. in 1994*. CR1
   - *As reported in the literature, a positive result from the Mantoux test is another diagnostic sign*. AJCR14

t. lack of studies in the topic and limitations of the research
   - *Many surgical interventions have been recommended* [...] *but preferred surgical option for management of GCD has not been established yet*. CR2
   - *Pathogenesis of achalasia cardiae and megaoesophagus is still unknown*. PPC23
   - *Pilomotor seizures were first descried by Fere in 1896 and have since been reported in 7 patients*. LAN1

u. overall recommendations for further treatment
   - *It is mandatory to perform a thorough exploration of all the small intestine and the stomach searching for retained bezoars during exploratory laparotomy*. CR1
   - *If these teeth do not cause interference with breast feeding and are asymptomatic, no intervention is required*. CR3
   - *In cases of treatment failure and hemodynamic instability, surgical exploration is recommended*. AJCR5

v. recommendations for further studies
   - *Further investigations are needed to determine the role of mosquitoes in the transmission of E anopheles and other bacteria*. LAN19

4. *Conclusion*

w. repetition of aim of the study
   - *This case describes an unusual presentation of Wilson disease and thus adds to the wide spectrum of clinical presentation of this disease*. CR10
   - *Our goal is to increase awareness of such condition. Our three cases happened in a short period of time* (*within 9 months*) *and that leads us to believe that this is more common than we expect and yet, it remains under recognized*. AJCR1
   - *We present a case of a patient with metastatic RCC with survival for over 10 years with use of sorafenib monotherapy*. JMCR10

x. repetition of importance of the issue
   - *Peritoneal tuberculosis is particularly uncommon in European countries. However, its incidence is growing due to the continuous immigration of people from tuberculosis endemic areas*. AJCR14

- *Our case was atypical because of the prolonged polyuria* [...]. LAN12

y. final conclusion/summary and recommendations
   - *In conclusion, patients presenting with large exophytic growth of oral cavity, squamous papilloma should be considered as one of the differential diagnosis*. CR4
   - *We conclude that an extra-articular resection of the hip using the Bernese periacetabular technique* [...] *is a useful combined treatment option for malignant femoral lesions involving the hip joint, especially in pediatric patients*. CRM34
   - *This method can be applied to patients diagnosed with decreased oesophageal motor function and usually is therapeutically effective*. PPC23

The list presented above contains all the possible aspects found in all the studied case reports of different varieties and derived from different journals. The analysis shows that they all have a similar structure: Introduction/Background, Case report/Case presentation, Discussion, and in the majority of CRs, Conclusion. The differences may concern the presence of individual steps in each section, e.g. in some of the analyzed CRs, there is no aim, references to former studies, recommendations for further studies, limitations of the research, etc., or their order. Only *The Lancet* requires a different CR structure – a short one-page CR without headings or an introduction and starting with the patient's presentation. In the *American Journal of Case Reports*, there is a section providing brief information about the patient, final diagnosis, symptoms, medication, clinical procedure and speciality (Fig. 1), placed before the abstract. This section is supposed to help readers to obtain general information about the case and to facilitate its understanding.

Patient:	Male, 15
Final Diagnosis:	Infectious Mononucleosis induced spleen laceratio
Symptoms:	Fever • headache • neck pain and upper shoulder pain which was worse with flexion and extension
Medication:	—
Clinical Procedure:	Splenic angiogram and proximal splenic artery embolization technique
Specialty:	Critical Care Medicine

Figure 1. Section in the *American Journal of Case Reports* (AJCR5).

The apparent similarity of different structures of CRs helps writers to create and publish their CRs, even in different languages and for different international journals.

Moreover, it may facilitate international scientific communication among specialists from the whole world.

6.3. Patient's perspective

The patient-centred approach in medical CRs is reflected in the "Patient's perspective" section – a story as told by the patient. It is particularly common in interactive CRs and consists of a brief case presentation with tests, treatment and results, as well as comments by different specialists (1) and a patient (2), as shown below:

- (1) *The advice that several respondents gave about sun protection is essential, and Ruth should be reassured that she cannot pass the condition on to her children.* BMJ1
- (2) *How have I felt about my condition being discussed? Well I am happy to have this discussion about my condition. I would prefer to know what is going on and often talk to my husband about these things.* BMJ1

The story by the patient is present also in integrated narrative and evidence based CRs in a form of a dialogue between the patient and the physician, as shown below (BMJ2):

- *Doctor: What about my story? My ego is flattered in this patient's care. She is an 'interesting case'; she writes to me, and I find much to be proud of in what she writes. Is it influencing my decision?*
- *Patient: I felt that in the consultation with the cardiologist my feelings and wishes were not even considered… You did say, however, that in the end it is my decision…*

It is worth noticing that the patient's perspective is also a significant part of *Patient Experience Case Studies*, part of the Canadian project *Patient First Review*. There are three booklets available, describing patients' stories: "Emma's Story – A woman's wait for hip surgery", "Matthew's Story – A child's experience of cancer diagnosis and treatment", and "Walter's Story – A Metis man living with chronic health conditions". Each study consists of a patient's story in active voice (1 – Matthew's Story), describing feelings and worries of the patient, and then the same case presentation but from the physician's point of view (2 – Matthew's Story retold).

- (1) *Over the weeks that followed, Matthew's pain intensifies and he found it increasingly difficult to sleep. Several months after the endoscopy, he came to his parents in the middle of the night crying, saying he couldn't sleep and was afraid he would never wake up.* PFR1

– (2) *During the appointment, the physician confirmed that Matthew appeared to have a small mass in his stomach. A biopsy was performed and the sample sent to the lab for analysis.* PFR1

In traditional CRs, the patient is also present but only as a subject of the report:

– [...] *corneal strength was very valuable for this young man patient.* CR2
– *His doctor prescribed citalopram* [...]. *He complained of feeling like an alien, and eventually stopped seeing his doctor.* LAN1

6.4. Metadiscourse indicators and grammar structures

According to Hyland and Tse (2004, 156–61), metadiscourse

> focuses our attention on the ways writers project themselves into their discourse to signal their attitude towards both the content and the audience of the text" and "it not simply the glue [...], but itself a crucial element of its meaning – that which helps relate a text to its context, taking readers' needs, understandings, existing knowledge, prior experiences with text, and relative status into account.

Hyland distinguishes *interactive* and *interactional* discourse. Interactive discourse helps to guide readers through the text while the interactional one involves readers in the argument, orienting them to the author's perspective (Hyland and Tse 2004, 168–9, Hyland 2000, 128–9, 2015, 2–4). Both types of discourse are realized through metadiscourse features (referred to in the present paper as "indicators"): interactive resources: transitions or transition markers, frame markers, endophoric markers, evidentials and code glosses; and interactional resources: hedges, boosters, attitude markers, engagement markers and self-mentions. Figure 2 below shows different types of indicators with their roles and examples (Hyland and Tse 2004, 169).

Category	Function	Examples
Interactive resources	Help to guide reader through the text	
Transitions	express semantic relation between main clauses	in addition/but/thus/and
Frame markers	refer to discourse acts, sequences, or text stages	finally/to conclude/my purpose here is to
Endophoric markers	refer to information in other parts of the text	noted above/see Fig/in section 2
Evidentials	refer to source of information from other texts	according to X/(Y, 1990)/ Z states
Code glosses	help readers grasp functions of ideational material	namely/e.g./such as/in other words
Interactional resources	Involve the reader in the argument	
Hedges	withhold writer's full commitment to proposition	might/perhaps/possible/ about
Boosters	emphasize force or writer's certainty in proposition	in fact/definitely/it is clear that
Attitude markers	express writer's attitude to proposition	unfortunately/I agree/ surprisingly
Engagement markers	explicitly refer to or build relationship with reader	consider/note that/you can see that
Self-mentions	explicit reference to author(s)	I/we/my/our

Figure 2. A model of metadiscourse in academic texts.

The analysis shows that metadiscourse indicators are commonly used in CRs, when interpreting results, giving an opinion about a case and concluding all the information. However, the largest number of different indicators can be found in the Discussion section, especially hedges, which weaken the power of statements. Examples of these indicators are provided in the table below:

Table 1. Metadiscourse indicators with examples.

METADISCOURSE INDICATORS		
	Examples from CRs	
Transition markers	additionally, also, although, as a result, because of, besides, but, consequently, even though, furthermore, however, in addition, likewise, moreover, nevertheless, on the other hand, since, so, therefore, thus, while, yet	– ***Moreover**, our patient seemed to reach the 3 out of 5 required criteria in order to make the possible diagnosis of giant-cell arteritis*. CRM27 – ***Furthermore**, the patient **also** lacked the common risk factors frequently associated with tricuspid valve disease*. CRM17 – ***Even though** we concede that this patient would have qualified for the vaccine because she is a smoker, we can **also** argue that evidence suggests she is a candidate by virtue of simply being AA*. CRM17 – ***Because of** low oxygen saturation and growing pleural effusion, the right pleura was punctured and antibiotics were adjusted*. AJCR1
Frame markers	first, in conclusion, in summary, overall, second, subsequently, then	– ***First**, the steep head-down tilt concealed the hemorrhage by increasing our patient's blood pressure. **Second**, unrestricted fluid management concealed the hypovolemia caused by bleeding*. JMCR1 – ***In conclusion**, this case study may be an example of the difficulty of diagnosing peritoneal tuberculosis* [...]. AJCR14
Code glosses	as illustrated, called, especially, or, such as, that is, that means	– *Teeth presenting at the time of birth **are called** natal teeth*. CR3
Endophoric markers	above, figure X, table X	– ***In the case described above**, the patient presented with features suggestive of hypoxia and did not have any clinical feature suggesting liver dysfunction*. CR10 – *Enterotomy was performed and an unclean foul smelling mass of hairs in the form of a bunch was found **[Fig.1,2]***. CR1 – *The patient had 22% eosinophils, and peripheral smear revealed numerous schistocytes (**Figure 1**)*. CRM23
Evidentials	(name, date), according to, as X noticed	– *Extracorporeal irradiation of autogenous timorous bone and its use for reimplantation was first described in 1968, **by Spira and Lubin***. CRM34
Hedges	almost, appear, approximately, can, could, could not, generally, in most, most, may, might, occasionally, often, possible, probably, seem, should, sometimes, suggest, to our knowledge, typical, usually, would	– *Manual dissection **can usually** be performed to nearly of 90% corneal depth*. CR2 – *"*[...] ***almost** half of patients present with trichophagia"*. CR1 – *Echocardiography showed, during diastole, the presence of a small dense formation of **approximately** 1 mm in diameter*. CRM27

METADISCOURSE INDICATORS		
	Examples from CRs	
Boosters	always, believe, clear, completely, confirm, demonstrate, demonstrated, know, show, shown, only	– *The **only** treatment for peritoneal tuberculosis is pharmacological*. AJCR14 – ***It is known** that tuberculous peritonitis often manifests without any evidence of other sites of tuberculous infection*. AJCR14 – *We are **thus confident** that, given the favorable evolution of the disease, the prognosis for our patient is now good.* AJCR14 – *The CT scan **showed** a significant hematoma in the lower neck* [...] AJCR1
Attitude markers	amazing, correctly, extremely, hopeful, important, interestingly, significant, unfortunately, unique, unusual	– ***Unfortunately**, histopathologic examinations on an excised corneal recipient obtained from that procedure was not conducted*. CR2 – *Another **important** benefit of DALK procedures is nylon 10-0 sutures can be removed earlier, although early reports suggested that sutures could be removed in DALK as early as 3 months postoperatively for a better wound healing*. CR2 – ***Interestingly**, our patients had prolonged PT* (*prothrombin time*) *but normal aPTT* (*activated partial thromboplastin time*). AJCR1 – *This case is **interesting** as it highlights one common and one rare aspect of HZ*. CRM8 – *Here we report an **extremely** rare case of trichobezoar of the ileum not associated with a trichobezoar in stomach*. CR1
Engagement markers	add, assume, choose, classify, compare, define, demonstrate, evaluate, follow, must, should, we (as readers and authors)	– *Besides highlighting an unusual presenting feature of Wilson disease, this case **draws our attention** to the fact that HPS **should be** considered in the differential list of central cyanosis even in absence of clinical features of liver disease*. CR10 – *We **chose** a medial abdominal approach* [...]. PPC19 **direct interaction with readers** – *However, taking data and clinical testing into consideration, **you must think** about it in differential diagnosis*. PPC1 – *In difficult cases, **we can combine** two or three antibiotics for a few weeks*. PPC1 – ***We must be** assertive in encouraging them to receive vaccinations to prevent serious illness*. CRM17

METADISCOURSE INDICATORS		
	Examples from CRs	
Self-mentions	we, our, the author	– ***We*** *examined his general health and found he was a healthy young man without any systemic diseases.* CR2 – ***In our case****, the clinical presentation and the age of the patient had led us to consider fever.* CRM27 – ***We*** *underline the fact that because of previous antibiotic therapies, blood cultures always resulted negative.* CRM27 – *In October 2011,* ***the authors*** *visited a 46-year-old immigrant Moroccan for the first time.* AJCR14 – ***Our patient's*** *blood pressure immediately dropped* [...]. JMCR1 – ***A doctor*** *ordered a complete blood count – the given results were positive.* PPC1 – ***The department*** *of infectious diseases used broad spectrum antibiotic therapy – Klacid.* PPC1

In the case reports analyzed, characteristic grammar structures have also been noticed such as tenses, voice and negative forms, as shown below:

z. present tense (indicating present research, facts, etc.)
   - *Irregular astigmatism* ***occurs*** *in 15%-50% of DALK.* CR2
   - *The most popular technique for deep anterior lamellar keratoplasty* (*DALK*) ***is*** *the 'big bubble'* (*BB*) *technique.* CR2
   - *CT of the abdomen usually* ***shows*** *a cystic well-encapsulated mass sometimes with mural calcification.* JCR12

aa. perfect tense (present achievements, continuation of patient's treatment, research)
   - *Massler and Sarara* ***have coined*** *the terms "Natal" and "Neonatal" for teeth that erupt at birth and immediately after birth till 1 month of age respectively.* CR3
   - *Prior to presentation, she* ***had been complaining*** *of sinus infection for the last six weeks that was treated with a five-day course of moxifloxacin.* CRM23
   - *A wide spectrum of rheumatologic diseases* ***has been associated*** *with peristaltic disorders of the alimentary tract, as observed in this case.* PPC23

ab. active voice, past tense (medical history)
   - *A fifteen year old girl* ***had*** *abdominal pain for four months.* CR1
   - *MRI also* ***showed*** *joint effusion, though there was no evidence of acetabular extension.* CRM34

- *On physical exam, her temperature **was** 102.8 F, heart rate **was** 98 bpm, respiratory rate **was** 34 rpm, and her blood pressure **was** 157/97 mmHg*. CRM17

ac. passive voice, past tense (especially in results, indicating action, not a person)

- *The patient **was transferred** to the intensive care unit*. AJCR1
- *The wound **was bathed** with metronidazol and **dressed**. 7-days of antibiotic therapy with Cefuroximum **was directed***. PPC1

ad. negative forms, adjectives

- *There **were no bezoars, neither** in the stomach **nor** in the duodenum and proximal jejunum*. CR1
- *He **denied** having routine long term medications or surgical history.* CR2
- *On one week follow-up, the visual acuity of his right eye was **unchanged***. CR2
- *A chest CT scan and a bone scintigraphy **did not show** metastasis*. CRM34

All the above-listed examples demonstrate that traditional CRs and their varieties include numerous metadiscourse indicators which help both the reader to understand text, and the writer/author to provide his/her opinion on the topic discussed. It is noteworthy that also grammar structures, e.g., tenses, have an impact on the rhetorical structure of the texts.

All the examples provided show different types of interaction with the audience (readers), expressing the author's stance and engagement, signalling tentativeness or certainty of provided opinions and beliefs, the author's visibility across the text, etc. Interestingly, the studies of metadiscourse in research articles across soft disciplines such as philosophy, sociology, applied linguistics and marketing, and hard disciplines such as mechanical engineering, electrical engineering, physics and microbiology, for instance Hyland's papers (2001, 2008), show significant disciplinary variation. Hyland (2008, 20) notices that metadiscourse markers are more common in soft disciplines than in the hard ones due to a more linear and problem-oriented approach to knowledge construction, as seen in the other group.

7. Conclusion

The genres of case reporting constitute an important part of scientific medical writing, but they often seem unappreciated. CRs are valuable sources of information about unknown diseases, new ways of treatment, diagnoses, etc. Moreover, as has been shown, CRs are important from an educational perspective as a helpful resource for medical

students, residents, and young doctors. Case reporting has been developing over centuries, from the times of Ancient Egypt, through Greek, Latin and Islamic medicine, till nowadays. In the 1980s and 1990s, traditional case reports lost their importance in the context of the newly introduced evidence-based medicine approach. Since 1990s new journals have been created for publishing case reports exclusively and new case reports varieties have been launched, for instance, interactive CRs or brief forms such as flashlights, case quizzes, etc. At present, it is also becoming more and more common to consider the patient's perspective, in light of the patient-centred model in medicine as well as the narrative approach in the humanities, viewing the patient's case as a story.

As has been shown, there are numerous studies of scientific writing in general and of medical discourse in particular, featuring also case reporting as examined from different perspectives, for instance, language features, role and importance, educational value, etc. The goal of this paper has been to provide an overview of the state of the art of and current research on case reporting, including historical background, characteristic features of traditional CRs and new forms as well as a review of the literature. The empirical part demonstrates that different varieties of CRs have a similar structure, consisting of particular steps, e.g. aim of the study (Introduction), medical history (Case Report section), references to present research (Discussion) or summary statement (Conclusion). The results also show similarities in grammatical features used in all analyzed CRs, for instance the present tense when describing facts or current knowledge. The metadiscourse indicators examined help readers to understand the text and writers to show an opinion, way of thinking, approach, etc.

The study may have implications for further research in the framework not only of linguistics, but also of medicine, biomedicine, medical ethics, sociology, etc. With regards to the linguistics field, more studies may be conducted from the perspective of specialized communication, discourse analysis, translation studies, etc.

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