

LATIN IN ENGLISH/SLOVAK NEUROLOGY TERMINOLOGY

Ingrid Cíbiková

University of Ss. Cyril and Methodius in Trnava, Faculty of Arts, Slovakia, ingrid.cibikova@ucm.sk

Katarína Chromčíková

Freelancer, Slovakia, chromcik.k@gmail.com

Abstract: The paper studies the use of Latin in Neurology terminology. Specialised communication in medicine is impossible without recognizing the unique role of Latin being the language of scientific progress in the processes of accumulation, preservation, documentation, and transfer of knowledge and expertise. The comparative terminology research deals with the identification, analysis, and assessment of Latin terms used in the English and Slovak neurological environment in the modern era. Latin presents the foundation of medical terminology and has been used since the beginning of the formation of medicine as a scientific discipline. The theoretical part of the paper defines basic terminological concepts and focuses on the field of neurology, English/Slovak neurology specialty, research methods, and methods of terminology work. To achieve the objective of the paper the following methods have been used: observation, excerption, conceptual analysis, term analysis, comparative analysis, classification of terms, and synthesis of data. It also describes the historical development of Latin, and medicine including medical terminology. Specialised medical language and terminology performs at international and national levels. Besides that, the paper describes the Greek influence on medical terminology and the importance of terminology literacy and terminology culture. The empirical part deals with the terminology work consisting of excerption, harmonization, and terminography. Many bilingual terminology records have been compiled with equivalents and terminology contexts and prepared for multiple uses as a terminology product: glossary, dictionary, database...). Neurological terms of Latin origin are excerpted from highly specialised neurology papers (100 terms from English papers, 155 terms from Slovak ones, 255 excerpted terms with their equivalents in total). As a result of partial comparative terminology, analysis terms have been classified according to their degree of assimilation and latinity. 100 neurological terms excerpted from the English written papers are divided into 3 categories: 46 multiple-assimilated terms, 45 Latin assimilated terms, and 9 semi-assimilated terms. 155 neurological terms excerpted from the Slovak written papers are assigned into 4 categories: 75 multiple-assimilated terms, 63 Latin assimilated terms, 15 non-assimilated terms, and 2 semi-assimilated terms. As a conclusion of comparative terminological research there are some findings and recommendations for practice pointing out that firstly, neurology specialists from both countries prefer use of Latin terms in communication with professionals, secondly, Latin terms are more dominant in the Slovak professional environment using the origin unchanged pronunciation, thirdly, studying the Latin language and terminology is essential for comprehending and defining the medical (neurological) concepts even in contemporary age, thoroughly, there are non-assimilated Latin terms in English written neurology papers, the English language prefers its own pronunciation rules, fifthly, findings help to model concept structures based on specialised knowledge of the field and clarify the relations between concepts, sixthly, preference for native language is recommended in national terminology, seventhly, the conceptual system facilitate the comparative analysis of concepts and designations across languages, and finally, the terminology literacy and competence is important for language users in every subject field.

Keywords: Latin, neurology terminology, English/Slovak terminology work, terminology analysis

1. INTRODUCTION

The paper studies the usage of Latin in the modern internationalized neurology within English and Slovak environments. Medical fields are developing at high speed which brings attention to the terminology itself. The medical terminology is specific in the context of using Latin terms. The main objective is to present the significant status of Latin in the contemporary field of neurology. The research focuses on the bilingual terminology work. Terms are excerpted, analyzed, harmonized, and classified. Such research requires not only terminology and linguistic knowledge but specialized/medical as well. Because of this, terminological research has been consulting with a medical specialist MUDr. Miroslav Chromčík. Terminology is a teamwork practiced by specialists, linguists, terminologist, translators as terminology intermediaries. Terminology documents the human knowledge.

Medical terminology in general involves the frustrating and challenging study of the wide variety of medical terms that underline the sometimes long and complex medical terms used in everyday medical circles. Medical terms are generally created from a combination of prefixes, suffixes, and root words, most of which ultimately originate in the Latin and Greek languages, although some word parts have German, French, or English origins (Learn medical terminology, 2020). Much terminology research has been conducted in mentioned so called big languages, but not or

rarely in so called small languages, that is why Slovak/ English comparative terminology research is considered to be the most valuable.

2. MATERIALS AND METHODS

After considering the current situation, the topic of a serious neurological diagnosis in relation to vaccination seemed like a good choice for terminology investigation. For the purpose of the terminology work, the following specialized neurological papers have been chosen to be analyzed: firstly, the specialized journal *Practical Neurology* available in English language at researchgate.net: *Protecting people with multiple sclerosis through vaccination, written by Saúl Reyes et al., 2020* (BMJ Journals, 2022 [online]), secondly, the specialized journal *Neurológia pre prax (Neurology for practise)*, available in Slovak with the supplement for the year 2021: *Očkovanie pacientov so sclerosis multiplex, poznatky z literatúry (Vaccination in multiple sclerosis patients, knowledge from the literature)*, written by doc. MUDr. Eleónora Klímová, CSc., 2021. The bilingual terminology corpus consists of 255 terms in total, excerpted from English and Slovak specialized neurology texts, 100 terms from the English and 155 from the Slovak paper. To achieve the objective of the paper terminology work in neurology as a research method was carried out and the following research methods have been used: observation, term excerption, conceptual analysis, term analysis, comparative analysis, classification of terms, and synthesis of data in terminology records. Terms with their equivalents and terminological context have undergone harmonization, terminological analysis, and terminography (terminological records). Many bilingual terminology records have been compiled with the terminological data, equivalents, definitions, and terminology contexts as a storage for a multiple use. Terminography is “*part of terminology work concerned with the recording and presentation of terminological data. Terminological data may be presented in the form of term banks, glossaries, thesauri or other publications*” (ISO 1087-1:2000, p.10). And what is more, they have been classified according to the degree of Latinity. Terminology work deals with the systematic collection, description, processing and presentation of concepts and their designations. Terminology work in general consists of term excerption, harmonization and terminography. Term excerption is a part of terminology work which involves extracting terminological data by searching through a corpus (set of special texts) (ISO 704:2009). Terminological database Termium Plus defines terminological analysis as “*the analysis of terms in context and of the concepts designated by them within a given subject matter in order to determine their interrelationships*” (TERMIUM Plus, 2012). During the terminology work, in the case of concept harmonisation there has been the activities for reducing or eliminating minor differences between two or more concepts which are already closely related to each other. In the case of term harmonisation there has been the activities leading to the designation of one concept in different languages by terms which reflect the same or similar characteristics or have the same or slightly different forms. During the terminology research the terminology concordance has been described, the ordered list of terms extracted from a corpus together with a context and a source reference is a part of the terminology records.

3. RESULTS

Medical branches are tightly interconnected. Medical terms with Latin origin have been analyzed predominantly. Many selected terms come from Infectiology, because of the vaccination, they have been discussed in connection to neurological diagnosis, in both analyzed papers. The excerpted terms are simple or complex terms, they have one-root or multi-root expressions and are presented in bold. In the sample of bilingual glossary terms and abbreviations are presented with their equivalents (e.g., DMTs, DMDs, DNA, mRNA, GWS syndrome, MMF syndrome). Relevant definitions have been compiled in terminology records, which are ready for multiple use in terminography. The specialists in both languages (language users) use some terms in original Latin /or Greek/ forms, some prefer the national equivalents, some prefer full term forms and some use abbreviations. The papers are written for specialists, that is why the medical terms are used in the text without any explanation or the medical terms are explained/defined at the beginning of the text (for example the abbreviation *BCG*). The interesting finding was the fact, that English specialists has used full terms in all cases of the occurrence, what is inconsistent with the English tendency to prefer abbreviations because of linguistic economy. On the other hand, the Slovak specialists has used both forms, the full-term forms, and abbreviated forms.

(Table 1): Bilingual glossary. Table 1 lists 42 terms with equivalents.

	English term	Slovak equivalent
1	Adolescent	adolescent
2	Anogenitalis	anogenitálny
3	Antigen	antigén
4	BCG , bacille Calmette-Guérin	BCG, Bacillus Calmette-Guérin

5	Cell	celulárna , bunková
6	Cervical	cervikálna
7	Demyelinating	demyelinizácia
8	Diagnosis	diagnóza, diagnostický
9	Diphtheria	diftéria
10	Disease-modifying therapy (DMTs)	terapie modifikujúce ochorenie, chorobu modifikujúce terapie
11	Exacerbate	exacerbácia
12	Factor	faktor
13	Haematopoetic , hematopoetic	hematopoetický
14	Hepatitis B	hepatitída B (HBV)
15	Herpes zoster, shingles	herpes zoster, pásový opar
16	Papilloma virus	papilomavírus
17	Humoral	humorálny
18	Immunity	imunita
19	Immunogenicity	imunogénnosť , imunogenita
20	Immunosuppressive	imunosupresíva
21	Infection	infekcia
22	Influenza, flu	chripka , influenza
23	Live-attenuated	(živé) atenuované
24	Interferon β , interferon beta	interferón β , beta interferón
25	Lymphopenia , lymphopaenia	lymfopénia
26	Multiple sclerosis	sclerosis multiples, roztrúsená skleróza
27	Neurology	neuroológia, neurologická
28	Pandemic	pandémia
29	Pertussis , whooping cough	pertussis, čierny kašeľ
30	Polio , poliomyelitis	poliomyelitída , detská obrna
31	Polysaccharide	polysacharid
32	Postvaccination	povakcinačná , postvakcinačná
33	Prophylaxis	profylaxia
34	Relapse	relaps
35	<i>Streptococcus pneumoniae</i>	<i>Streptococcus pneumoniae</i>
36	Tetanus	tetanus
37	Transplant	transplantácia
38	Typhoid	brušný týfus
39	Vaccination	vakcína
40	Varicella vaccine	varicella
41	Varicella-zoster virus (VZV)	varicella-zoster vírus (VZV)
42	Yellow fever	febris flava, žltá zimnica

In the analysed scientific paper written in the English language, the phoneme /e/ is represented by a digraph "ae" in the term '**haematopoetic**' according to the principles of the Latin orthography. On the contrary, the specialised term 'lymphopenia', is found in two different variants with the alternative spelling: 'lymphopenia', as well as 'lymphopaenia'. The morpheme haemo- is a variant of hemo- which is preferably used in British English-

In Slovak specialised scientific texts, both orthographic variants are acceptable. Table 1 presents the results of the research: medical terms in specialised texts are predominantly used as Latin, Greek, or Latinised variants, even though both languages recognize domestic variants. While the English language recognizes the terms *flu* or *whooping cough*, the specialised equivalents of Latin origin *influenza*, *pertussis* are also used. Only in the case of *herpes zoster/shingles*, both terms are acceptable and frequently used in the sample text.

The same tendency has been observed in the analysed Slovak scientific paper. The specialised terms *herpes zoster*, *celulárna*, *pertussis*, *poliomyelitída* have been preferred to general, unmarked terms *pásový opar*, *bunková*, *čierny kašeľ*, *detská obrna*. The term *žltá zimnica* has been found as its Latin variant *febris flava*, as well as the term *sclerosis multiplex* was replaced by *roztrúsená skleróza*.

Terminological analysis has focused on special *terminology contexts*, reflecting the example of usage of medical/neurology term in medical practise. Definitions are a very important textual support on terminology record, because they provide the clear understanding of the term, help to recognize and compare an essential and delimiting characteristics of the concepts among languages (ISO 704:2009). The terminological data in terminology records and equivalents have been excerpted, matched and checked in Slovak-English parallel corpuses, specialised monographs, textbooks, scientific papers, relevant dictionaries and glossaries.

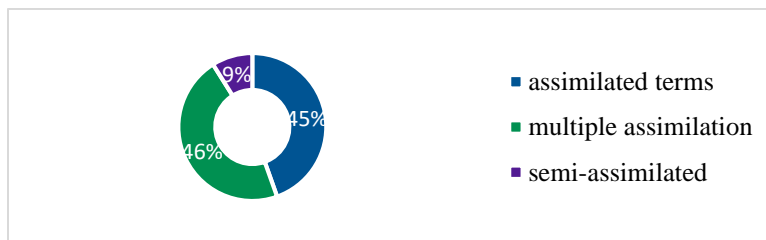
4. DISCUSSIONS

The excerpted terms have been classified to several categories according to their degree of Latinity. The categories have been based on the classification of Lysanets and Bieliaieva (2018) after innovating the one by Bujalkova and Dzukanova (2015).

1. Assimilated Latin terms – modifying under the influence of English/Slovak linguistic environments;
2. terms after multiple assimilation – modifying under Ancient Greek, Old French, Latin language;
3. semi-assimilated terms – modifying their pronunciation according to English phonetic rules (Lysanets and Bieliaieva, 2018, p.1). Semi-assimilated terms in scientific paper written in Slovak are modifying according to Slovak pronunciation rules;
4. non-assimilated Latin terms.

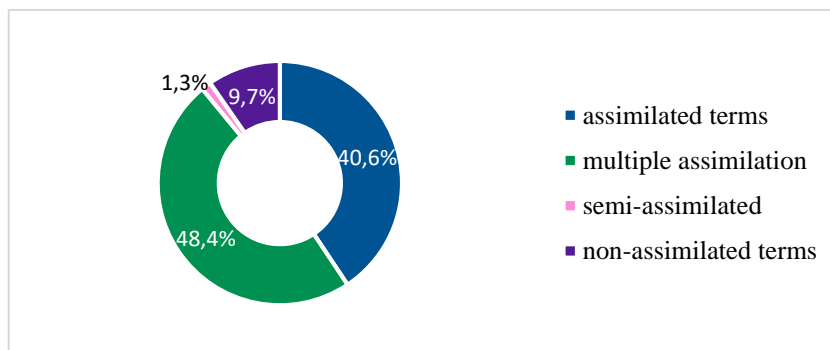
Each term has been classified according to described categories.

Graph 1: Representation on the degree of Latinity in scientific papers written in English



The most numerous category 46% are the terms after multiple assimilation. The category of assimilated Latin terms represents (45%) of the research sample. The smallest category 9% are semi-assimilated terms. There is the absence of category of non-assimilated terms. From the etymological point of view, the excerpted medical terms, have their roots in the Latin language (e.g., *adolescent, antibody, circulation, diagnosis, influenza/flu, pregnancy*). Latin terms have spread into general language throughout the years in the process of terminologisation. For example, many adjectives and nouns are used in specialised and general language concurrently. For example, the nouns *skin, nose, eye, mother and adjectives nasal, optical, and maternal*, respectively. The terminology analysis has revealed the variation of Latin digraph from *ae* to simple *e*, e.g., *haematopoetic* → *hematopoetic*, *lymphopaenia* → *lymphopenia*. While simple *e* is preferably use in British English. Pronunciation has not changed. However, both forms are usually acceptable in writing. English medical terminology richly uses abbreviations, for example, the full form *disease-modifying therapy* is of Latin origin, the abbreviated form is DMT, only disease is of the French origin). The shortened term *dTaP* stands for *diphtheria, tetanus, and acellular pertussis vaccine*. The individual terms are of Latin and Greek origin. There are two different abbreviations used by professionals *dTaP* and *DtaP*. The origin of this difference has not been discovered.

Graph 2: Representation on the degree of Latinity in scientific papers written in Slovak



The most numerous category 48,4% are the terms after multiple assimilation. The category of assimilated Latin terms represents (40,6%) of the research sample. The smallest category 9% are semi-assimilated terms. There is 9,7 % of non-assimilated terms. The smallest category of semi-assimilated terms is represented by only 2 terms. The quantitative comparison of Latin terms within two linguistic environments shows that the two most numerous groups of terms are the same, the groups of assimilated Latin terms and terms after multiple assimilations (48.4% to 46%, and 40.6% to 45%).

We have observed that many neoterms have been borrowed from English even though their origin lies in Latin, and Greek: for example, *ASIA syndróm*, *Covid-19*, *Macrophagic Myofasciitis Syndrome MMF*. Slovak medical terminology richly uses Latin terms in practice. This phenomenon has been observed in the research when terms such as *Clostridium tetani*, *febris flava*, *herpes zoster*, *Neisseria meningitis*, *Streptococcus pneumoniae* have been preferred to modified *klostrídium*, *pneumokok*, or to Slovak term *žltá zimnica*, *pásový opar*. Even the major topic of the neurology text, *sclerosis multiplex* has been written in original form, and later in abbreviated form as MS. The Slovak equivalent '*roztrúsená skleróza*' is used in popular scientific papers for the general public. Latin terms are in the Slovak environment influenced by Slovak linguistic rules. Affixes of Latin or Greek origin are substituted with the Slovak ones. Phonological-wise, the Slovak pronunciation is similar to the Latin except for some specific Latin rules /e.g., ae→e, oe→e, ph→f/. Ancient Greek plays an important part in medical terminology by influence the Latin language during the beginning and formation era. Many terms of the multiple assimilation category have been assigned there because of their Greek origin and later have been Latinized. The fact that Latinity is still present in modern neurology texts and terminology has been proved.

5. CONCLUSION

The scientific neurology papers have revealed that the specialists prefer original Latin and Greek variants of terminology even there is a possibility to use domestic terminology. Latin represents the exactness of medical science and terminology. Ancient Greek language has a significant place in specialized medical terminology too.

The excerpted term *typhoid* resembles *typhus* (which is also similar to Slovak equivalent *tyfus*). Both terms, typhoid and typhus cause fevers, however, the agents are different bacteria therefore the treatment is different. In medical terminology there are a huge amount of such controversies referring the need for exactness and the importance of terminology education, terminology literacy and culture.

During the analysis of the excerpted terms, we have observed that Latin-based and Greek-based terms are prevalent in comparison to the English borrowings. Medical terminology has been evolving since the Age of Classical Greece and Rome, and most of the terms have roots in the ancient languages in modern era. The terminology work reflects the absence of Slovak terminology products and dictionaries and has been substituted by Czech sources. Medical students and medical specialists use Czech textbooks and literature in their practice. Even though the Latin language might be considered a dead one, it is still the important part of medical terminology. Exactness, possibility of term-formation, and international comprehensibility are still the characteristics of modern Latin medical terminology. The final number of 255 excerpted terms (100 English + 155 Slovak) have undergone harmonization, terminology analysis and have been divided into categories according to their degree of Latinity. The categorization process has resulted in 46 multiple-assimilated terms, 45 Latin assimilated terms, and 9 semi-assimilated terms from the English paper. The neurology paper written in Slovak language consists of 75 multiple-assimilated terms, 63 Latin assimilated terms, 15 non-assimilated terms, and 2 semi-assimilated terms. The use of Latin language is more prevalent in modern Slovak medical terminology than in the modern English medical terminology. There is the gap of medical literature and terminographical products in the Slovak environment. The significant influence of English, its international status and influence on specialized language has not caused the exclusion of the Latin language from terminology of medicine. In conclusion, terminology documents the knowledge, and it is important to manage terminology in national and international level.

ACKNOWLEDGEMENTS

The paper has been written within the project KEGA 006UCM-4/2021: Specialised communication and terminological literacy in foreign language education in secondary vocational education.

REFERENCES

- ASKLEPIOS. (2013). Úvod do slovenskej lekárskej terminológie. Postup terminologickej práce. p. 35. Retrieved from <http://www.datasolution.sk/pdf/t8.pdf>
- ASKLEPIOS. (2011). Slovenská lekárska terminológia. p. 45. Retrieved from <http://www.datasolution.sk/pdf/termin0.pdf?PHPS-ESSID=9c9d4c3dcf9c89244>

- Bujalkova, M., & Dzuganova, B. (2015). English and Latin Corpora of Medical Terms – A Comparative Study. *International Journal of Humanities Social Sciences and Education*. Retrieved from https://www.researchgate.net/publication/291332458_English_and_Latin_Corpora_of_Medical_Terms_-_A_Comparative_Study
- Castiglioni, A. (1947). *A History of Medicine*. New York: Alfred A. Knopf, Inc.
- Chabner D-E. (2021). *The Language of Medicine*. Twelfth Edition. North York: Elsevier.
- Cfbiková, I. (2012). *Terminologický manažment verejnosprávnej tematickej oblasti*. Žilina: Žilinská univerzita v Žiline, 2012. 177 p. ISBN 978-80-554-0559-9.
- Clackson J., & Horrocks G. (2007). *The Blackwell History of the Latin Language*. Oxford: Blackwell Publishing Ltd.
- Dzuganova, B. (2018). Various Aspects of Medical English Terminology. *Towards Understanding Medical Translation and Interpreting*. 195
- Dzuganova, B. (2013). English medical terminology — different ways of forming medical terms. *Jahr – Annual of the Department of Social Sciences and Medical Humanities*. Retrieved from <https://www.jahr-bioethics-journal.com/index.php/JAHR/article/view/78/86>
- Dzuganova, B. (2002). A brief outline of the development of medical English. *Bratislavské Lekárske Listy*. 103(6), 223-227
- ISO 704: 2009. Terminology work – Principles and methods
- ISO 1087-1:2000. Terminology work — Vocabulary — Part 1: Theory and application
- ISO 22128:2008. Terminology products and services
- Joskowska, K. (2013). Greek and Latin in medical terminology. *Folio Medica Copernicana*. Retrieved from https://journals.viamedica.pl/medical_research_journal/article/viewFile/36871/26411
- Kachlik, D. et al. (2008). Anatomical terminology and nomenclature: past, present and highlights. *Surgical and Radiologic Anatomy*. Retrieved from https://www.researchgate.net/publication/5362650_Anatomical_terminology_and_nomenclature_Past_present_and_highlights
- Klímová, E. (2021). Očkovanie pacientov so sclerosis multiplex - poznatky z literatúry. Bratislava: SOLEN. Neurologia pre prax. ISBN 978-80-7471-382-8.
- LEARN MEDICAL TERMINOLOGY (2020). by NEDU LLC, NurseEdu.com. Complete Guide to Master Medical Terms for Healthcare Professionals. ISBN: 978-1-952914-01-0
- Lysanets, Y.V., & Bieliaieva, O.M. (2018). The use of Latin terminology in medical case reports: quantitative, structural, and thematic analysis. *Journal of Medical Case Reports*. Retrieved from <https://jmedicalcasereports.biomedcentral.com/track/pdf/10.1186/s13256-018-1562-x.pdf>
- Marganne, M-H., & De Haro Sanchez, M. (2014). At the Crossroads of Greek and Roman Medicine: The Contribution of Latin Papyri. 1. Medical Texts; 2. Iatromagical Papyri. *'Greek' and 'Roman' in Latin Medical Texts*. 29. Retrieved from https://doi.org/10.1163/9789004273863_008
- Pavel, S., & NOLET, D. (2001). *Handbook of terminology* [online]. Ottawa: Public Works and Government Services Canada, 2001. 172 p. [cit. 2021-11-23]. Available on: <http://publications.gc.ca/collections/collection_2007/pwgsc-tpsgc/S53-28-2001E.pdf>. ISBN 0-660-61616-5
- Reyes, S. (2020). Protecting people with multiple sclerosis through vaccination. *Practical Neurology*. p.435-445. ISSN 1474-7766.
- Swanson, L. (2015). *Neuroanatomical Terminology. A Lexicon of Classical Origins and Historical Foundations*. New York: Oxford University Press.
- TERMIUM PLUS: The Government of Canada's terminology and linguistic data bank. [online]. [cit.2022-03-19]. Available on: <<https://www.btb.termiumplus.gc.ca/tpv2alpha/alpha-eng.html?lang=eng>>
- Vejražka, M., & Svobodová, D. (2014). *Terminologiae medicae Ianua. Úvod do problematiky řeckolatinské lékařské terminologie*. Praha: Galén.
- Wingerd, B. (2019). *Medical Terminology Complete*. Fourth Edition. New York: Pearson.