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UNVEILING THE ORIGINS AND METHODS OF FORMATION OF MEDICAL TERMINOLOGY

Mamatova Nilufar Abdukhoshimovna

nilufarmamatova1975@inbox.ru,

Abdulhairova Firuza Invarovna

feruza_3018@mail.ru,

Gofurova Gulmira Mannopovna

gulmiraxongofurova575@gmail.com,

Makhmudova Gulchekhra Dilshadbekovna

makhmudovagulchekhra1975@gmail.com

Andijan State Medical Institute, Uzbekistan

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ABSTRACT

This article focuses on the evolution of English medical terminology. While in the past, medical terms were primarily created morphologically by combining Latin and Greek word elements, today, the syntactic method is more prevalent. This involves forming complex terms that are later abbreviated or turned into acronyms. Besides the usual methods, there are also less common ways of forming terms. Understanding the meanings of these uncommon medical terms requires studying their etymology and the reasons behind their creation. Medical terminology is particularly intriguing as it illustrates the interplay between extralinguistic and linguistic factors

INTRODUCTION

Over the previous century, there has been substantial growth and development within the field of clinical medicine, spawning numerous new branches, thanks to advancements in science and technology. This progress has led to the emergence of various diagnostic tools and techniques, including computed tomography, sonography, mammography, laparoscopy, endoscopy, colonoscopy, magnetic resonance imaging (MRI), and more. Presently, these developments are marked by increased global connections, the modernization of international professional communication both orally and in writing, and the rapid growth of professional discourse in English, which has become the universal language of scientific exchange. Additionally, new diseases like AIDS, bovine spongiform encephalopathy, bird flu (H5N1 virus), and swine flu (H1N1 virus) have arisen, necessitating their identification, documentation, and dissemination among scientists and the general populace. Consequently, the creation of new medical terminology is imperative. How have these new terms been coined, and what are the prevailing methods of term formation today?

The creation of new terms within each medical field warrants careful attention as these terms gradually integrate into everyday language. There exists a profound interconnection between the common language and the language of science. Approximately three-quarters of all written and printed materials in the common language consist of scientific language. While everyone employs the common language, the language of science necessitates a certain level of scientific literacy, as terms, being descriptors of specific concepts, only convey their meaning accurately to experts. Most anatomical and clinical terms utilized in contemporary medicine originate from Latin or Latinized Greek words dating back to the 5th century BC. For medical terminology to function effectively and be comprehensible, it is imperative that terms are accurately formulated, derived, and pronounced.

Specialists working in the medical field require access to a comprehensive dictionary that accurately interprets professional vocabulary and terminology. A crucial aspect of professional intercultural communication is ensuring the correct phonetic form of words. In bilingual medical dictionaries, phonetic information becomes indispensable for those learning a foreign

language for both oral and written communication. The issue of registering terms and developing their pronunciation characteristics in modern industrial dictionaries needs immediate attention.

With the rapid advancement of medical-biological, medical-chemical, and medical-technical knowledge, the proliferation of specialized medical terms is ongoing. Many new scientific concepts and terms continually emerge in medicine, while existing ones often undergo modifications. Analyzing English medical terminology allows for a thorough examination of development trends and the methods of term formation, shedding light on the principles of linguistic nomination.

The necessity to explore the intricacies of forming a terminological framework for medicine, considering its social and linguistic context, is highly pertinent. A synchronous-diachronic approach to examining this subject enables a deeper understanding of linguistic phenomena, identifying their position within the language system, recognizing patterns and unique characteristics, and tracing their evolution.[1] Despite the valuable research conducted by various scholars focusing on specific aspects of this complex field, a comprehensive understanding of medical terminology's development remains elusive, as it often overlooks the emergence of entirely new terms and phrases in medicine.

In contemporary English medical terminology, terms are formed through diverse methods. These methods include metaphorical and metonymic term creation, the incorporation of common vocabulary into specialized terminology, synonymy, affix term formation, conversion, compound word formation, and abbreviation. Medical terminology in the English language isn't isolated within a distinct lexical layer; rather, its expansion is influenced by words from general literary vocabulary. This phenomenon is attributed to the increasing interaction between medical vocabulary and general literary language, which reflects the differentiation and integration of lexical layers, as well as the specialization of lexical units.[2]

The migration of lexical units from general vocabulary to medical terminology occurs through the specification of their meanings. As commonly used words become terminological, their usage becomes more specialized, signifying a particular concept with precision. Terminology involves a word's unique ability to function in both non-terminological and terminological contexts, illustrating the evolution of specialized terminological meanings from common literary words.

In the realm of medical terminology, there are two distinct phenomena: a meticulously crafted, globally standardized anatomical terminology and a swiftly evolving clinical terminology across various medical disciplines, marked by a degree of terminological confusion. This discrepancy primarily stems from the rapid advancement of scientific knowledge, necessitating prompt naming of new devices, diseases, symptoms, and the like. Despite efforts to unify clinical medical terminology internationally, these endeavors have generally fallen short. The initial attempt to establish a unified international classification of diseases dates back to the 19th century, but lacked consistent rules and, akin to today's International Classification of Diseases (ICD), merely serves as a technical tool for statistical purposes. The absence of standardized medical terminology becomes particularly evident in the contemporary era with the integration of computers into medicine, demanding flawless international communication.

From linguistic perspective, the exploration of clinical terminology proves more intriguing due to its diversity and vividness. Many examples in this discourse are drawn from hematology, a relatively young field of medicine undergoing continuous development, offering numerous fascinating phenomena to observe. This investigation necessitated the comprehensive application of methods and techniques from modern linguistics. Linguistic analysis methods such as the descriptive approach, distributive analysis, component analysis, contextual scrutiny, and comparative examination were employed in processing empirical data. The comparative method encompassed elements of comparative interpretation and typological attributes.

Medical terms can be mainly divided into single-word terms and multi-word terms. Single-word terms can be simple (non-derivative) words, derived words, compounds of derivatives and complex words. As a rule, new vocabulary is formed due to three reasons: it is spread in three possible ways:

1. The emergence of new names.
2. The formation of new meaning.
3. Borrowing words from other languages.

Some linguists divide the methods of forming new terms into the following groups:

1. Morphological method of word formation – compounding words, abbreviation;
2. Syntactic method - through the formation of phrases and word combinations from several words;
3. Semantic method - narrowing (clarification) of the meaning of commonly used words; more metaphorical and metonymic transfer of previous meaning;
4. Borrowing words from other languages.

The research shows that the most productive way of forming terms is word formation with affixes. The produced medical terms may consist of a prefix, one or two basic words, and a suffix in various combinations, as presented in the following examples:

myocardium = myo- (prefix) + card(ium) (basic word); endocarditis = endo- (prefix) + card (basic word) + -tis (suffix); cytology = cyt(o) (basic word) + -logy (suffix); gastroenterology = gastr(o) (basic word) + enter(o) (root) + -logy (suffix); adenoma = aden(o) (basic word) + oma (suffix). [6]

The second most productive type of term formation is compounding words. A compound word is a fixed expression consisting of two or more stems, for example: *human being , blood donor , hay fever, Black Death (plague)*. While in German compound words are easily recognized because they are always written together, in English the spelling of compound words varies. Phrases can be written in the following ways: 1. Phrases consisting of two/three words: *blood pressure, blood group, heart attack, sleep walker, central nervous system*; 2. Hyphenated: *life-span , collar-bone*; 3. Phrases appeared as one word: *gallstone, haemophilia, leucocytopenia, pseudopolycytemia*.

There are no strict rules for writing compound words. Sometimes some terms are written with a hyphen, sometimes as two different words or one word, for example, *life span - life-span; gall bladder - gallbladder*. The structure of compound words appears older than word formation from a diachronic point of view, since derivational affixes developed from independent words. A similar process can be seen today in the process of prefixoids (pseudo-prefixes) and suffixoids (pseudo-suffixes), for example, *myo-, arthro-, haemo-lhaemato-, adipo-, hepato, onco-, patho-; -aemia, -logy, -tomy, -pathy, -cyte, -algia, -ectomy, -scope, etc*. Each of these pseudo-affixes carries a specific meaning, but they are not used as independent words. They were formed artificially from the roots of Greek and Latin words for scientific purposes - to give names to new concepts.

Both types mentioned are also considered morphological because they undergo certain morphological processes. Although word formation and composition prevailed mainly through the use of basic words and affixes of words of Latin and Greek origin in the past, currently the syntactic method predominates - composing phrases from several words, for example: *Acquired Immune Deficiency Syndrome, Bovine Spongiform, Encephalopathy, Severe Acute Respiratory Syndrome, Irritable Bowel Syndrome*. They subsequently undergo a process of abbreviation because they are too long. Many English abbreviations have become so well known internationally that many people may not even know their full forms (AIDS, HIV, BSE, SARS, and IBS).

The fourth type of word formation is abbreviation. Abbreviation is a shortened form of a word or phrase. There are many ways to form abbreviations. They usually, but not always, consist of a letter or group of letters taken from a word or phrase. Abbreviations arise in written language, and their colloquial varieties can be only graphic (g - gram, h - hour), both graphic and phonetic *(G.P - general practitioner*), or acronymic, for example, *AIDS*. Acronyms are initial abbreviations pronounced as separate words, such as *HIV (Human Immunodeficiency Virus)*. As

a rule, acronyms and initial abbreviations are considered as subgroups of abbreviations. Some linguists do not recognize that there is a big difference between acronyms and initial abbreviations, and use the latter term for both. [4]

Initial abbreviations are very popular in written English for shortening long descriptive terms. For example, biochemical terms such as: *deoxyribonucleic acid - DNA , ribonucleic acid - RNA , adenosine triphosphate - ATP* ; the terms of clinical medicine: *Acute Lymphocytic Leukaemia - All, Chronic Lymphocytic Leukaemia - CLL , Thrombotic Thrombocytopenic Purpura - TTP, Autoimmune Thrombocytopenia - AITP, Idiopathic Thrombocytopenia - ITP*, etc. [6]

Initial abbreviations are so common in texts that it is necessary to first enter the entire phrase and then its abbreviation to avoid misunderstanding, for example, the initial abbreviation *CML* - can mean either *chronic myeloid leukaemia* or *chronic monocyte leukaemia* [8].

In addition to the main types of word formation, there are minor types such as conversion, reverse word formation and truncation.

During conversion, a word moves from one category of words to another category of words, without the use of morphological funds. This process developed on the basis of the semantic need to put new meaning into a word. In this way, verbs are formed from nouns and adjectives, or nouns from verbs, and so on. For example, *position - to position, lecture - to lecture, blind - to blind, to check - check-up*. Sometimes, instead of learning new adverbial suffixes, students incorrectly use conversion, i.e. putting a noun in front of another noun so that it functions as an adjective, for example, *connection tissues* instead of *connective tissue, skeleton muscles* instead of *skeletal muscles, nerve system* instead of *nervous system* [7]. Inversion is the process of creating a new lexeme, usually by removing actual or intended affixes. The formed neologism is called inverse derivation, a term coined by James Murray in 1889. This derivation process is very rare in medical terminology. We found only two medical terms formed in this way. The word *syringe* is derived from its plural form syringes, where the ending -s is dropped (from the Greek singular *syrinx*, plural *syringes*). The verbs *euthanase* or *euthanize* come from the noun *euthanasia*. While backformation can change parts of speech or the meaning of a word, truncation creates shortened forms of longer words but does not change the part of speech or meaning of the word. Truncation is a type of word formation that seems to be used more often in professional slang than in ordinary terms. They arise as terms of special groups, such as: educational institutions, army, police, medical profession, etc. Truncated words appear after the loss of the initial, final or central part of the word. Truncation of the ending is the most common type, in which the beginning remains unchanged, for example, *exam(ination), lab(oratory), doc(tor), vet(erinarian) = veterinary physician*. In medial truncation, the middle part of the word remains unchanged, for example, *flu (influenza)*. When the front part of a word is truncated, the ending remains unchanged, for example, *(uni)versity, (polio)myelitis[8].*

In any language, people tend to express themselves as economically as possible and to eliminate unnecessary parts of long, complex or multi-word terms without changing their meaning. In hematological terminology, for example, the basic morpheme *-cyto-* is often omitted in many terms, for example, *erythro (cyto) poiesis, granulo(cyto)poiesis, thrombo (cyto)penia, thrombo (cyto) pathia, thrombo(cyto)asthenia* [6].

Too many synonymous terms for one concept is an undesirable phenomenon in scientific language and promotes misunderstanding. Although polysemy, homonymy and synonymy are undesirable phenomena in medical terminology, they are nevertheless relatively numerous, and no branch of medicine can avoid them.[3] Polysemy and synonymy accompany the development of every new branch of medicine. While homonyms are quite rare within one branch of medicine, synonyms quantitatively expand the vocabulary. Synonyms are defined as words with the same or very similar meanings. Synonymy is closely related to calques (words translated from other languages). Synonymy can appear on several levels. Along with the international Greek/Latin term, its synonym has developed, formed from foreign (Greek/Latin) elements, for example, *erythrocyte - normocyte; neutrophil - polymorphonuclear leucocyte; antihaemophylic factor A - coagulation factor; siderotic anemia - sideropenic anemia; haematopoiesis - sanguinification*, [7] etc.

Such synonyms arise due to different motivations for the formation of individual terms. For example, in the term *erythrocyte* is emphasized by red color. Its synonym *normocyte* emphasizes the normal development of cells. Similarly, in the term *neutrophil*, the neutral dye used in staining leukocytes in laboratories became the main motivating element in the development of this term, while in its synonym *polymorphonuclear leucocyte*, the main role was played by the number of nuclei of different shapes that the white cell contained.

International Greek/Latin terms are translated into English, for example, *erythrocyte - red blood cell (RBC); leukocyte - white blood cell (WBC); thrombocyte - blood platelet; monocyte - mononuclear cell; haematopoiesis - blood cell production; coagulation - blood clotting; haemolysis - blood destruction; haemostasis - arrest of bleeding*.[6] Translations (calques) of Greek/Latin terms into English have different stylistic meanings and suitability. While the international terms erythrocytes, leukocytes, thrombocytes and coagulation are used by specialists, their English equivalents red blood cells, white blood cells, blood platelets and blood clotting are used in articles or speeches aimed at the general reader or listener.

Sometimes, together with a borrowed term, several translation options are obtained, and they mutually fall into a synonymous relationship, for example, *erythrocyte - red (blood) cell - red (blood) corpuscle; phagocyte - phagocytic cell - defensive cell or colloquially scavenger cell; haematostasia - control of haemorrhage - control of bleeding - prevention of blood loss*. A similar synonymous relationship exists between the following terms: *Hodgkin's disease - Hodgkin's granuloma - Hodgkin's sarcoma; myeloproliferative syndrome - myeloproliferative disease* or *myeloproliferative disorder*.[6]

In the past, medical terminology often borrowed medical terms from Latin, however, at present this process of word formation is rather unproductive. Borrowings from other languages are characteristic of the modern period. A large number of English scientific words entered the language from French.

According to various sources, about 30% of all English words are of French origin [9]. This kind of medical terms include the following words: *bowel, cartilage, cramp, curette, degeneration, deglutition, delivery, denture, diarrhoea, diphtheria, disease, dislocation, malaise*, etc. Another 29% of words are of Latin origin (*femur, humerus, occiput, mandible, puncture, pulp*), 26% of words of Germanic origin are ordinary words of daily use (*hand, finger, nose, arm, chin, wrist, foot, head, hip, hair)*, about 6% of Greek origin (*bregma, chorion, diabetes, emphysema, myopia, ophthalmia, pneumonia, stigma, trauma*) and about 6% are taken from other languages, and 4% are derivatives of proper names. While borrowed words are lexical borrowings, calques are borrowings from other languages with literal, word-by-word, or conquered translations.[5]

Although the formation of terms may seem formal and uninteresting to many people, in addition to the precise, pragmatic, structural forms of word formation, there are also many other ways of forming terms that hide a whole story in their names. Sometimes a language teacher may struggle to collect, study, summarize, and even write about them, but discussing the origins of terms with medical students gives them a deeper understanding of the history of medicine and gives them the opportunity to look at certain terms from different perspectives. Another important point is that in teaching and practicing medicine we must be absolutely and unequivocally sure of the meaning of the terms we use. Analyzing important medical terms forces us to think about their exact meaning and be aware of any possible ambiguity.

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