



Review Article

A comparison of the anatomical terminology in the last 25 years



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ABSTRACT

Introduction: Anatomical terminology forms the basis of communication in all health sciences. The terminology has been changing continuously since the 19th century, in accordance with the scientific innovations and clinical requirements.

Methods: In this study, the changes in anatomical terminology observed over the past 25 years were examined. The changes in anatomical terminology in Nomina Anatomica (1989), the Federative Committee on Anatomical Terminology list (1996) and Terminologia Anatomica (1998) were assessed.

Results: Comparisons revealed that 129 terms were removed from the terminology and 1359 terms were added from Nomina Anatomica to Terminologia Anatomica. Furthermore, 196 of these terms were added from the FCAT list. In addition, grammatical changes were made in 563 terms over the past 25 years.

Discussion: Many terms were added or replaced in accordance with scientific innovations and clinical needs. As a result of these innovations, we can conclude that the anatomical terminology is growing larger day by day; these recently added terms are bringing a new scientific approach to anatomy.

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1. Introduction

Anatomical terminology forms the basis of health sciences worldwide. This terminology began to develop 2500 years ago and majorly comprises Greek and Latin words. Since the 19th century, anatomists began to work toward creating an international database and simplifying the terminology. This exercise focused on 50,000 anatomical terms.²

The first Nomina Anatomica Congress assembled in Basel, Switzerland in the spring of 1895. This congress published the Basel Nomina Anatomica list, which comprised 4311 terms. This list was not accepted worldwide; it was only accepted in Germany, Italy, America, and Latin America.⁷

Development of Nomina Anatomica continued after the initial publication. The main aim of this development was to gain worldwide acceptance and to resolve its deficiencies. Subsequent meetings took place in 1933 and 1935 in Great Britain, and in 1955 (the International Anatomists Congress). These meetings were followed by publishing of the Nomina Anatomica and its worldwide acceptance. Editions released in 1961, 1966, 1977, and 1983 maintained their reliability; in the edition released in

1989, the final form was given. This edition has been revised two times owing to prior developments in modern medicine. In this study, we assessed Nomina Anatomica (1989), the Federative Committee on Anatomical Terminology (FCAT) list (1996), and Terminologia Anatomica (1998) and revised according to recent changes in anatomical terminology.⁴

2. Materials and methods

In this study, Nomina Anatomica (1989), the FCAT list (1996), and Terminologia Anatomica (1998) were assessed.

Anatomical terminology was systematically and locally compared. The systems assessed were the muscular, articular, skeletal, gastrointestinal, respiratory, urinary, cardiovascular, lymphatic, and nervous systems; furthermore, sensory organs as well as the reproductive system and perineum were studied. Quantitative results regarding these changes are presented in Table 1.

3. Evidences

We compared anatomical terminology that was included in Terminologia Anatomica but not in Nomina Anatomica, in Terminologia Anatomica but not in the FCAT list, and in Nomina Anatomica but not in Terminologia Anatomica and latin language changes.^{6,7}

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There were 1359 new terms found in Terminologia Anatomica but not in Nomina Anatomica. Of these terms, two pertained to the endocrine glands, 10 to abdominopelvic cavity, 10 to the respiratory system, 12 to the skin, 29 to the urinary system, 38 to the joints, 47 to the organs associated with hearing, 52 to the lymphatic system, 54 to the reproductive system, 57 to the skeleton, 84 to the terms of general anatomy, 94 to the digestive system, 116 to the cardiovascular system, 151 to the muscles, and 603 to the nervous system. (Table 1)

There were 196 new terms included in Terminologia Anatomica but not in the FCAT list. One of these terms pertained to the endocrine glands, four to the urinary system, four to the organs associated with hearing, five to the digestive system, five to the respiratory system, seven to the joints, nine to abdominopelvic cavity, 10 to the lymphatic system, 10 to the cardiovascular system, 18 to the reproductive system, 23 to the skeletal system, 30 to the nervous system, 31 to general anatomy, and 39 to the muscle system. No changes were found pertaining to the skin. (Table 1)

There were 129 terms found in Nomina Anatomica but not in Terminologia Anatomica. Of these terms, one term pertained to the skin, one to the reproductive system, one to the lymphatic system, two to abdominopelvic cavity, two to general anatomy, five to the skeletal system, five to the joints, six to the digestive system, six to the respiratory system, six to the urinary system, seven to the cardiovascular system, seven to the organs associated with hearing, 11 to the muscles, and 69 to the nervous system. No changes were found pertaining to the endocrine glands. (Table 1)

A total of 563 terms related to Latin language changes were noted; of these, one pertained to the urinary system, three to the skin, seven to the reproductive system, 14 to the respiratory system, 17 to the muscles, 20 to the joints, 21 to the lymphatic system, 26 to general anatomy, 31 to the digestive system, 34 to the organs associated with hearing, 58 to the skeletal system, 123 to the cardiovascular system, and 208 to the nervous system. No changes were found pertaining to the endocrine glands and abdominopelvic cavity.

4. Discussion and conclusion

A limited number of studies related to anatomical terminology can be found in the literature. In a study by Kachlik², it was observed that the number of terms related to the central nervous system and the locomotor system were higher than that related to

the other systems in Terminologia Anatomica. In the Kachlik study (2013), 112 changes were observed in the number of terms related to the skeletal system only, from 1955 to present. In our study, we also noted that 140 terms related to the skeletal system underwent a change in the past 25 years.⁶

Meanwhile, in the study published by Kachlik et al. in 2008, it was reported that 1082 new terms were found pertaining to the nervous system. Nevertheless, in our study, 633 new terms were observed pertaining to the nervous system. It is considered that this discrepancy arises from the fact that some of these changes were counted in the category of Latin changes in our study.³

According to our evidences, all of these changes together with added and removed terms in different publications are categorized as those having undergone Latin language changes.

When the newly added terms in different publications were analyzed, it was noted that the main headings have become broader in meaning because of their dependence on the increase in the number of formation and diversity of the terms. For instance, the main heading written as “organa oculi accessoria” in Nomina Anatomica is written as “structurae oculi accessoriae” in Terminologia Anatomica.

Although they may be considered to be classical book knowledge and are used in anatomical courses, some terms are not found in Terminologia Anatomica but have become part of the terminology by being updated in recent publications. Some examples include “fundiforme ligament of the penis,” “clitoris suspensory ligament,” and “intramural portion of the ureter.”

However, although some terms used in books were found in Nomina Anatomica, they were removed from the terminology in the FCAT list only to again be added to the terminology once their deficiencies were understood. “Nervus vertebralis” and “Lemniscus trigeminalis” are examples of this.

In the most recent edition, many structures have been shown to be divided into groups. For instance, although ductus deferens was used in the previous edition, in the recent edition its four parts are separately stated. To make better regional classification, more clear top titles were added to the terminology from the FCAT list, such as compartmental titles in extremities.

With regard to scientific innovations at the recent edition, new terms were added to the anatomical terminology. For instance, the term “crista sinutubularis,” which was not included in the FCAT list, was added to the eighth edition as “crista supravalvularis,” which is its Latin translation.

Table 1
Quantitative results of changes in the anatomical terminology.

| | In Terminologia Anatomica but not in Nomina Anatomica | In Terminologia Anatomica but not in the FCAT list | In Nomina Anatomica but not in Terminologia Anatomica | Latin changes |
|----------------------------------|--|---|--|------------------|
| General Anatomy | 84 | 31 | 2 | 26 |
| Skeletal System | 57 | 23 | 5 | 58 |
| Articular System | 38 | 7 | 5 | 20 |
| Muscular System | 151 | 39 | 11 | 17 |
| Gastrointestinal System | 94 | 5 | 6 | 31 |
| Respiratory System | 10 | 5 | 6 | 14 |
| Excretory System | 29 | 4 | 6 | 1 |
| Reproductive System | 54 | 18 | 1 | 7 |
| Abdominal Cavity and Perineum | 10 | 9 | 2 | 0 |
| Endocrine Glands | 2 | 1 | 0 | 0 |
| Cardiovascular System | 116 | 10 | 7 | 123 |
| Lymphatic System | 52 | 10 | 1 | 21 |
| Nervous System | 603 | 30 | 69 | 208 |
| Sense Organs | 47 | 4 | 7 | 34 |
| Skin | 12 | 0 | 1 | 3 |
| Total | 1359 | 196 | 129 | 563 |

Finally, some of the terms commonly used in clinics were added beginning from the FCAT list, such as “lordosis cervicis,” “lordosis lumbalis,” and “scoliosis.”

In the examination of Latin changes, the names of some of the anatomical structures were amended to restate localization based on scientific innovations. The roots of ansa cervicalis appeared in Nomina Anatomica as “radix anterior” and “posterior,” but these roots appeared in Terminologia Anatomica as “radix superior” and “inferior.” In Nomina Anatomica, the term “nucleus corporis trapezoidei posterior” was used; however, beginning from the FCAT list, instead of “posterior,” the terms “nucleus lateralis,” and “medialis corporis trapezoidei” were used.

In addition, in Nomina Anatomica, the Latin changes were expressed as singular terms, but in the recent edition they were expressed as plural terms. For example, in the FCAT list, the term “foramen incisivum” was replaced with “foramina incisiva.”

In nomenclature of numerous arteries and nerves, the names of the structures were changed to be more understandable. The term “rami lobi superioris” from the FCAT list was changed into the term “arteriae lobares superiores” in Nomina Anatomica. Other examples include changes such as “arteria lobaris media” instead of the “rami lobi medii” and “arteria canalis pterygoidei” instead of “ramus pterygoideus.” In the nervous system, using the term “nervi clunium medii” instead of “rami clunium mediales” from the FCAT list is one example.

Many artery names have been changed to be more understandable and detailed. For example, the term “arteriae pudendae externae” in Nomina Anatomica was changed to “a. pudenda externa superficialis and profunda” in the FCAT list. Moreover, in Nomina Anatomica, the term “ramus basalis anterior” (a branch of a. pulmonalis dextra) has been changed to the term “a. segmentalis basalis anterior.”

As an example for the venous system, the terms “sinus intercavernosus anterior” and “posterior” instead of “sinus intercavernosi” were used beginning from the FCAT list.

The names of some anatomical terms were changed to better define the anatomical structure and to be more understandable. A typical change is that “ligamentum umbilicale mediale” was changed to “chorda arteriae umbilicalis.”

Some terms in Nomina Anatomica were classified into different subtitles in the last two terminologies. For example, “nervus pectoralis medialis” and “lateralis” were included under “pars infraclavicularis” of the brachial plexus in Nomina Anatomica but were moved to “pars supraclavicularis” in the FCAT list and Terminologia Anatomica.

In addition, Nomina Histologica and Embryologica were included in Nomina Anatomica but not in the FCAT list and Terminologia Anatomica. However, many histological terms were added under the relevant headings of organs in Terminologia Anatomica. For example, the histological terms “urethra masculina,” “tunica muscularis,” and “stratum circulare” were added to the FCAT list.

In addition, the FCAT List and Terminologia Anatomica comprise English terms. This was seen as an advantage by some researchers in many countries where the language of medical education is English. Allen believed that this represents an essential source of reference for anyone studying anatomical sciences. The indexes form an invaluable tool for finding either the Latin or English term.¹ However, some researchers believed that the unofficial list of English terms was unable to provide the exact meaning of Latin terms, and it was considered as the drawback of Terminologia Anatomica.⁵ Recently, clinicians have used English terms in their clinics; thus, this may degenerate the Terminologia Anatomica.

Eponymous terms were included in the FCAT list, and indexes of Latin and English terms have also been added to Terminologia Anatomica.

The addition of sex symbols was another new concept in anatomical terminology. Nomina Anatomica did not include gender of the structures; in the FCAT list, gender-specific symbols are added to the sides of structures.

In conclusion, anatomy terminology has been changed continuously over the past 119 years. As long as scientific advances occur, these changes should be continued. For this reason, anatomical terminology also should be updated periodically to keep up with the times.

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