"Hypotheses and theories, even those less accurate, carry the potential of promoting further discoveries” (Claude Bernard, 1865)

**SUGGESTED ALTERATIONS IN TERMINOLOGY FOR THE INFLAMMATORY PROCESS**

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**Abstract**

A suggestion was made in order to alter the terminology of an inflammatory process from the Latin term of *inflammatio* or the Greek term of *phlogosis* to *stromatitis* (*stroma* – connective tissue sub-layer). The new term reflects the morphological base of the process and indicates that inflammation develops not in the parenchyma or in cells of tissues and organs but in their stroma. The suggested substitution has been supported by scientific and etymological arguments as well as by numerous examples.

**Key words:** inflammation, novel terminology, suggestions.

The suggested alterations in terminology of inflammatory process include substitution of the till now, employed Latin term of *inflammatio* (*flamma* – fire, *inflammare* – inflame) or the Greek term of *phlogosis* (*phlego* – I start fire) by *stromatitis* (*stroma* – connective tissue sub-layer). In every case the applied ending "*itis*" is correct and typical of the inflammatory process, but the core of the Latin or Greek term could be changed.

Inflammation belongs to those paradoxical ideas in medicine, in which the medical world finds common language despite the erroneous term and great difficulties in estimating the essence of the phenomenon (9). Intensity of individual stages of inflammation and overlapping of the stages with no clear-cut limits between them result in greatly complicated course of inflammation and also in a complicated nomenclature itself. It should also be mentioned that the inflammatory process manifests numerous reciprocal interactions with other pathophysiological phenomena in the form of feedback systems and auto regulation. The controversial nature of defining inflammation, frequently leads to the argument that the term should be eliminated from medical literature, and that it should be substituted by components of the extraordinary complex process (8). Inflammation manifests a polyetiological nature and; accordingly, a response mechanism of the body is highly variable and frequently unpredictable. Inflammation demonstrates a primarily defensive character, and as a rule is favourable for the body; however, on the other hand, it represents a reaction that often leads to hypertrophy of organs or cell organelles, neoplastic transformation, and even death. Both for a patient and a doctor the term unequivocally associates with a disease. Perhaps in the future, non-specific immune responses, including autoimmunisation, will provide an important categorisation criterion, as an additional link developing between humoral and cell-mediated immunities and associated with them. Already now, the mechanism is known to condition the inflammatory processes, *e.g.*, in leukocytes of inflammatory infiltrate, induction of integrins beta 1, 2 and 3 takes place, on endothelial cells expression of intercellular adhesion molecules (ICAM) and of vascular cell adhesion molecules (VCAM) develop, and preliminary stages of activation of lymphocytes T and B are observed (4, 10).

Providing rationale for the suggested alterations in the name of inflammatory process, it should be recalled that inflammatory reaction (inflammation) develops within the proper connective tissue (*textus conjunctivus*), i.e., in its ground substance, connective tissue fibres and blood vessels, while cells of the tissue represent the active defensors. They include neutrophils (microphages), monocytes and macrophages (histiocytes), eosinophils, mastocytes, basophils, plasma cells, lymphocytes, fibro – and myofibroblasts, neutrophils. The cells not only directly counteract the inflammation-inducing agents by, *e.g.*, phagocytosis and cytology of bacteria but also release the so-called inflammatory mediators, *i.e.*, chemical substances, which recruit subsequent cells to the reaction, as well as other chemical compounds, such as, *e.g.*, kinins, complement, PAF (platelet-activating factor), TNF (tumour necrosis factor), prostaglandins, leukotrienes (1,
2). In parallel, it should be recalled that in newborns, in particular in human newborns, no plasma cells are present, which results in cellular reactions distinct from those in adults. In newborns, the cellular reaction involves erythroblasts, myeloblasts, myelocytes, and other bone marrow cells, originating from haematopoietic foci in the liver and spleen in the foetal period (5). In turn, the extracellular matrix (ECM) or *substantia intercellularis* represents a gel consisting of 7 types of glucosaminoglycans (GAG), which bind to proteins forming proteoglycans (PGAG) and of glycoproteins (fibronectin, laminin, osteospondin). They bind substantial amounts of water, forming the porous gel of ground substance. The latter allows transportation of various molecules, provides medium for movement of cells and acts as a filter (the so-called molecular sieve), stopping various toxic substances (7). Apart from the ground substance, the intercellular matrix contains collagen fibres, reticular fibres, elastic fibres, oxytalan fibres, and eluanine fibres. It should be added that glia represents an equivalent to connective tissue in central nervous system and epithelial cells form such an equivalent in the thymus. Additionally, blood represents a specific type of connective tissue.

Inflammation used to be defined as a complex local reaction, involving mesenchymal and vascular systems (3). In parallel, it should be stressed that only coexistence and collaboration of three types of morphological lesions: retrogressive lesions (degeneration, necrosis, depolymerisation), disturbances in circulation, and proliferative lesions comprise the complete definition of inflammation. The specific involvement of connective tissue in the inflammatory process provides rationale for the idea that inflammation is, in a certain sense, “an inflammatory collagenogenesis”, particularly because the inflammation develops within the tissue (6). The best confirmation for the definition is interstitial inflammation, manifesting by lesions localised first of all in the connective tissue sub layer of an organ. In fact, such a location can be noted in all other types of inflammation but it is not always so clearly evident.

The suggested substitution by the universal term *stromatitis* not only reflects the morphological site of the process and clearly indicates that inflammation does not develop in the parenchyma or in cells of tissues and organs but allows also for standardisation of the entire complex nomenclature of the processes. First of all:

- the Latin names of various inflammatory processes are formed by addition of the ending "itis" (feminine, the third declination) to the name of an organ. A significant proportion of inflammatory processes carry fully Greek names, formed by the combination of word core and the ending "itis", e.g., encephalitis, and not *cerebritis* (Latin), nephritis, and not *renitis*, colitis, and not *crassitis*. The mentioned terms could be substituted by: *stromatitis cerebri, stromatitis renis, stromatitis intestini crassi*. Then:

- the use of the so called exceptions could be avoided in nomenclature of inflammatory processes, such as: *pneumonia* (inflammation of lungs), *pneumocystosis* (inflammation of lungs caused by *Pneumocystis carinii*), *angina* (inflammation of throat, tonsils and palate), *tuberculosis*, *actinomycosis*, *granuloma s. inflammatio granulomatoso*, *coryza* (catarrhal inflammation of nasal mucosa), *morbus rheumaticus* (rheumatic disease or non-suppurative inflammatory disease), irritable colon or *colitis spastica* (the so-called irritable intestine), *lupus erythematosus* and particularly richly represented suppurative processes: *phlegmone, acne, abscess, apostema, furunculus, carbunculus, paronychia, panaritium, pyorrhea, empyema, pyonephros, pyocephas, pyaemia, hordeolum*, the names of which, contain no "itis" ending. The exemplified names would be substituted by the new ones with the classical for inflammation "itis" ending: *stromatitis pulmonis, stromatitis pharyngi*, *stromatitis subcutis*, etc.

In the mentioned names, certain exception is formed by the word of *pneumonia*, employed in English language to denote pneumonia, e.g., hypostatic pneumonia, in some other occasions equivalent to pneumonitis, e.g., interstitial pneumonitis or alveolitis, e.g., exogenic allergic alveolitis – allergic exogenic inflammation of pulmonary alveoli.

Finally, full names of inflammations contain Latin core and Greek ending, e.g. *gingivitis* – itis (inflammation of gingiva), *appendicitis* – itis (inflammation of appendix) and they could be substituted by: *stromatitis gingivae, stromatitis appendix vermiformis*.

Certain nomenclature problems result from the term of *cellulitis*, which seemingly denotes "inflammation" of a cell (cellula – a cell) and, in fact, corresponds to suppurative inflammation of subcutaneous connective tissue. Finally, certain descriptive forms of inflammatory processes and their synonyms could be abbreviated, e.g., *hepatitis purulenta circumscripta s. hepatitis apopietatosa s. abscessus hepatitis s. hepatitis purulenta unilocularis s. localis* could be abbreviated to *stromatitis hepatitis purulenta localis*.

Considering the above, subdivision of inflammation would reflect involvement of its three components, i.e., circulatory disturbances, progressive lesions, and retrogressive lesions and would be suggested to include: *exudative stromatitis*, and not *exudative inflammation*, proliferative or productive *stromatitis*, and not proliferative inflammation and *alterative stromatitis*, and not *alterative inflammation* (Table 1).

In parallel, it should be added that the word "stromatosis," even if similar to "stromatitis", denotes proliferation of endometrial stroma, composed of multipotent mesenchymal cells with high potential to transform to various morphological forms, e.g., under influence of hormones. The hyperplasia acquires the form of *stromatosis* or *hyperplasia of endometrial stroma* (foci of stroma, which lack the glandular tubuli), *nodular stromatosis* (a benign tumour) or *stromal sarcoma* (5).
## Table 1
Terminology of inflammatory processes – selected examples

<table>
<thead>
<tr>
<th>Current term</th>
<th>Suggested new term</th>
</tr>
</thead>
<tbody>
<tr>
<td>(etymology: Lat. = Latin, Gr.= Greek, m. = mixed)</td>
<td></td>
</tr>
<tr>
<td>pharyngitis</td>
<td>stromatitis pharyngei</td>
</tr>
<tr>
<td>hepatitis</td>
<td>stromatitis hepatitis</td>
</tr>
<tr>
<td>pneumonia</td>
<td>stromatitis pulmonis</td>
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<tr>
<td>encephalitis</td>
<td>stromatitis cerebri</td>
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<tr>
<td>nephritis</td>
<td>stromatitis renis</td>
</tr>
<tr>
<td>colitis</td>
<td>stromatitis intestine crassi</td>
</tr>
<tr>
<td>gingivitis</td>
<td>stromatitis gingivae</td>
</tr>
<tr>
<td>appendicitis</td>
<td>stromatitis appendix vermiformis</td>
</tr>
<tr>
<td>inflammatio exsudativa</td>
<td>stromatitis exsudativa</td>
</tr>
<tr>
<td>inflammatio proliferativa</td>
<td>stromatitis proliferativa</td>
</tr>
<tr>
<td>inflammatio alterativa</td>
<td>stromatitis alterativa</td>
</tr>
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Finally, it should be mentioned that blood, representing a specific type of connective tissue, may provide space for dissemination of bacteria or of their toxins. Most probably, the stage may start the chain of alterations in blood, which could be regarded as “an inflammatory” process in the tissue. The response would be expressed by, e.g., leukocytosis, eosinophilia, lymphocytosis. An example of such processes is provided by *bacteriaemia*, the condition in which bacteria periodically penetrate to the blood, although they do not proliferate there and induce no lesions in organs and tissues, *toxaemia* (a condition in which blood is contaminated with bacterial toxins but not with bacteria), *septicaemia* or *sepsis* (blood is contaminated with both bacteria and their toxins and the bacteria proliferate in blood). Sepsis may involve contamination of blood also with viruses (*viraemia*) or fungi (*fungaemia*), suppurative sepsis (*septico-pyraemia* or *pyaemia*) denotes a condition in which purulent bacteria settle in various organs while *parasitaemia* denotes the presence of parasites in blood. This, however, transgresses the domain of pathomorphology.

### References