



## MIS Immunolog - Practical Results and Conclusions

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### РЕЗЮМЕ, ABSTRACT

This paper presents special medical software for investigations, prognosis and education at different aspects of systemic lupus erythematosus (Ukr. z. telemed. med. telemat.-2009.-Vol.7,№1.-P.71-72).

**Keywords:** lupus, medical information system, data base, Software

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### МИС «IMUNOLOG» - ПРАКТИЧЕСКИЕ РЕЗУЛЬТАТЫ И ВЫВОДЫ

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Статья посвящена описанию программного обеспечения для изучения, прогнозирования и обучения по проблемам системной красной волчанки (Укр.ж.телемед.мед.телемат.-2009.-Т.7,№1.-С.71-72).

**Ключевые слова:** системная красная волчанка, медицинская информационная система, база данных, программное обеспечение

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### МИС "IMUNOLOG" - ПРАКТИЧНІ РЕЗУЛЬТАТИ Й ВИСНОВКИ

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Стаття присвячена опису програмного забезпечення для вивчення, прогнозування й навчання із проблем системного червоного вовчака (Укр.ж.телемед.мед.телемат.-2009.-Т.7,№1.-С.71-72).

**Ключові слова:** системна червона волчанка, медична інформаційна система, база даних, програмне забезпечення

Bulgarian medical practice is recognized and proved as a professional and correct, but still there are some lacks like computer investigations and statistical backgrounds, as well digitalized results for lots of rare and not so popular diseases, regardless of the enormous database of paper records, lack of suitable software solutions and experts to work with. Systemic lupus erythematosus (SLE) is one of these diseases, where a person's immune system attacks and injures the body's own organs and tissues, but what causes it remains unknown. Almost every system of the body can be affected by SLE, which is deeply embarrassed by the varying patients' status. We have addressed these problems and developed a specialized software system for assessing both current lupus disease activity and changes in that activity since the patient was last seen. Software solution "Imunolog" is developed after winning international project between University Hospital Alexandrovska, New Bulgarian University and Barcelona Medical University. That system also performs educational functions in New Bulgarian University – it is a model for courses in medical informatics and data bases. We use it to present to the students a structural approach in elaborating an Information system for a concrete disease (Fig.1). One of the fundamental initiatives of the software is to localize the main

predispositions for this disease based on the statistic data from Bulgarian patients for 40 years period, the relationship between treatment and following manifestations of the disease, sequence of results from a concrete therapy and other systems reactions and adaptation.

SLE is not a rare disorder, but its aetiology remains unknown. A genetic predisposition, sex hormones, and environmental trigger(s) likely result in the disordered immune response that typifies the disease. Because patients with the disease may suddenly have worse symptoms (called a flare) after exposure to things like sunlight, alfalfa sprouts, and certain medications, researchers suspect that some environmental factors may also be at work. Knowledge-based expert care of patients with SLE leads to fewer hospitalizations secondary to uncontrolled disease exacerbation, less severe renal disease with fewer patients experiencing end stage renal disease requiring chronic dialysis, fewer episodes of vascular necrosis requiring total joint replacement, and less severe osteoporosis and fractures. The purpose of software solution "Imunolog" is to index as many as possible patients in Bulgaria – up to now there is no information about their exact number, to examine the applicable treatment schemes in Bulgaria and to define the results.

*The software solution.* The Medical Information System is by definition an organized collection, storage, and presentation system of medical data and other knowledge for decision making, progress reporting, and for planning and evaluation of programs. MIS "Imunolog" is a specialized computer record for a specific rheumatoid disease – LUPUS. The development covers and manages information to: assure data quality, support monitoring / alerts,

link records / sources, data sharing, aggregate information, support decision making. In the standard medical practice diagnosing of SLE can be somewhat difficult, because there are no definitive tests and the symptoms vary and change. After entering any kind of symptoms, the system applies mathematical model with different values and weights for every symptom that supports the medical expert diagnosis decision.



Figure 1. CD with MIS "Imunolog"

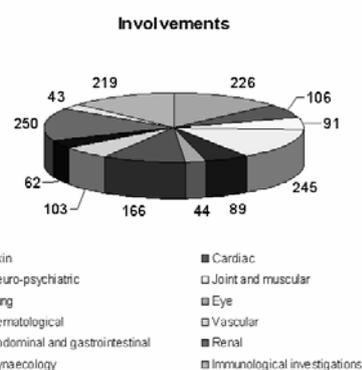
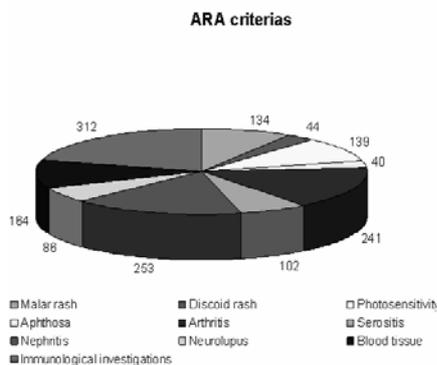


Figure 2. Symptoms according ARA criteria

For 2 years period are entered 100 patients from 5 different hospitals in Bulgaria with approximately 360 visits, it is translated and adapted an English version of MIS "Imunolog" and it was introduced an educational on-line platform for assistance from distance to the medical staff, which works with the software. The second useful educational tool is CD "PC applications for rheumatoid disease", where are described basics of Information systems, discussed the main rheumatoid diseases and presented the publications of the authors on this theme.

According to the entered data to the current moment the sex distribution is - 83 women: 17 men. Considering the statistics of all patients' visits, the involvements with biggest score are renal disorders, followed by joint and muscular manifestations and skin rash. The smallest percent of involvements is to gynecology system. ARA criteria (Fig.2), which also vary through the treatment period, are indexed per

visit. At the current moment the immunological investigations are with biggest presence – we have approximately in half of the visits this criterion, followed by nephritis and arthritis. For the Bulgarian medical institutions this is the first specific immunological database with retrospectively entered information. Actually, there is no comprehensive information about patients in the web media in Bulgarian language – treatment schemes, new methods, how to get used to this disorder, what are the chances, where to find expert help. Our purpose is to ensure statistical background on the one hand for researching and on the other – complete information for the population. The advances in medical care, genetic tests and development of software database for precise statistics and research would make possible to cure and even to prevent from these fatal disease.

## References and webliography

- Hahn B.H. Systemic Lupus Erythematosus / In: Harrison's Principles of Internal Medicine.-Ed. By A.S.Fauci et al.-New York: McGraw-Hill, 1997.
- Lupus Foundation of America.-<http://www.lupus.org>.
- Penjurov I., Mihova P. CD „PC applications for rheumatoid disease”.-ISBN 13: 978-954-535-468-7.-Sofia, 2008.
- Penjurov I., P.Mihova,J. Vinarova, Exploitation results of MIS Imunolog, 5<sup>th</sup> Balkan Congress of Immunology, Ohrid, Republic of Macedonia, June 01-03, 2008.
- Vinarova J., Mihova P. Medical informatics.-Sofia, 2009.

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