

APPLICATION OF METHOD OF THE WEIGHED TOTAL FOR DIAGNOSTIC INDEX SIGNIFICANCE CALCULATION IN DIFFERENTIAL DIAGNOSTICS OF DERMATOLOGICAL DISEASES

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Abstract: The basic methods of decisions making in multi-criterion conditions are considered, from which the method of the weighed total for calculation of diagnostic indexes significance in differential diagnostics of dermatological diseases is chosen.

Keywords: dermatology, differential diagnostics, method of the weighed total, multi-criterion task.

ACM Classification Keywords: Decision Making

Introduction

The external cover of human body – skin, is constantly exposed to influence of various factors of external environment that is why pathological processes are developing in skin. In everyday clinical practice the dermatologists quite often run into a situation, when discerning of reliable clinical diagnosis is difficult. It is explained by both a plenty of possible displays of dermatological pathologies and many symptoms are characteristics of different diseases. A different importance of the symptom is not equal for different diseases, that still more complicates differentiation of diagnoses [Ананьев, 2005]. This is the reason why task of differential diagnostics of dermatological diseases can considered like a multicriterion task.

Determination of significance of diagnostic indexes

Normative (formal) methods, which assume that an expert know the definite rational method of correct decision choice, are basic methods of decisions making in multicriterion conditions [Брахман, 1984]. Depending on the role of an expert in forming and grounding of importance of alternative diagnostic decision all formal methods divide by axiomatic, lines, methods of compensation, methods of thresholds of incomparableness and man-machine methods. From these methods for task of differential diagnostics of dermatological diseases direct methods are most useful. Due to such group of direct methods an expert can formulate of resulting significance of the given symptom for each disease as dependence on its estimations on private criteria without the theoretical grounds, and the parameters of this dependence (weight and expressed of symptom) are formed directly by the method of expert estimations [Кац, 2004]. Because for every disease there is the set of diagnostic indexes which fully describe one, for calculation of significance of this set for differential diagnostics of the given dermatological disease the method of the weighed total can be apply expediently:

$$U_i = \sum_{j=1}^m \delta_{ij} f(x_j),$$

where $\sum_{j=1}^m \delta_{ij} = 1$, δ_{ij} – weight of j -th diagnostic index for the i -th disease;

x_j – estimation of degree of j -th diagnostic index.

As well as for all direct methods, for the method of the weighed total rigorists to the experts are characteristic, especially on the initial stages of work at forming of expert estimations.

Conclusion

It is possible to do a conclusion, that a plenty of methods of decision of the multicriterion tasks oriented to the concrete problem situations is presently developed. For estimation of significance of diagnostic indexes at differential diagnostics of dermatological diseases expediently to use the weighed total method. Application of this method will allow improving quality of differential diagnosis discerning.

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