Personalized approach of planning the aesthetic of prosthetic restorations is preferred nowadays. The correlations between the facial features of the individual, personal characteristics and patients preferences are objectives of many modern researches.

PURPOSE

The purpose of this research is to analyse main features of the four facial types – strong, dynamic, delicate and calm (according to the adapted classification of Hippocrates) and by mathematical modelling to be generated digital face maps for facial type determination.

MATERIALS AND METHOD

91 Full face pictures with maximum smile were made in standardized conditions from them 42 male and 49 women of age between 18 and 30 years old.

The faces were categorized in four main types: strong, dynamic, delicate and calm (according to the adapted classification of Hippocrates). Four basic elements which characterise the face were determined: Face contour, eyes, nose/eyebrows, mouth and each of them determine 25% of the main type. By the principal of kefaloscopy each element of the face was classified to one of the four types.

Each picture was analysed by a software “VisagiSMile”. By specially developed module (Analysis of the face – map selection) by marking of 27 facial landmark points were generated digital facial maps for each face. 12 basic facial sections were defined. Based on all these data were generated mathematical models which describes each type.

RESULTS

Facial characteristic of each individual is a combination of features typical for many types with different level of dominance over one another. In 64,3% of the men and 59,2% of the women were established features of two types, while in 35,7% of the men and 40,8% of the women – three types. Faces only with one type or with features of four types wasn’t established.

There were generated averaged digital facial masks, describing each of four main types.

Analysing the distribution of facial types for the hall group it was established that the strong type was typical for 29,7% of the cases, dynamic in 26.9%, delicate in 21,2%, calm in 22,3%. Between the genders weren’t found statistically significant differences in strong type (p = 0,041< 0.05) and delicate type (p = 0,016 < 0.05) and small differences between the other two types.

After classifying the faces according to the dominant types we digitalised the data. By marking 27 landmark points were generated digital face map for each individual. By statistical analysis made with IBM SPSS Modeler software were established 12 important facial measurements with different level of importance for the face geometry for men and women.

Based on the received data were generated mathematical models characterising each facial type.

CONCLUSIONS

1. By mathematical modelling were generated four digital facial maps for each of the main facial types: strong, dynamic, delicate and calm.
2. Generated average digital facial masks could be used for digital facial analysis with the algorithm C5.1 – classification tree with confidence to 84,337% of determined by them facial type.
3. Created software compares each feature to the reference maps and calculates which shape fits best. By using the results for all features, it classifies the type of the whole face.