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The abstract of the thesis "A standardized approach of the patient with abdominal obesity"
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Background: The abdominal circumference (with its normal ranges depending on sex, race, and age) is a more sensitive index than body mass index for the evaluation of the cardio-vascular risk. Its increase is associated with insulin resistance and the other obesity related consequences, even in subjects with normal weight. This research aimed towards developing a standardized protocol for the evaluation of the patient with abdominal obesity and the analysis of the factors involved in the metabolic complications.

Aim: the development of an algorithm for the management of patients with abdominal obesity**.**
Objectives:

1. Development of a protocol for the nutritional evaluation of patients with abdominal obesity
2. Development of a protocol for the metabolic evaluation of abdominal obesity
3. The evaluation of immunologic and hormonal factors in a subgroup of patients with end-stage renal disease.

Material and method
A retrospective study was conducted on a sample of 349 patients with abdominal obesity, defined as waist above 80 cm in females and 94 cm in males. Exclusion criteria: secondary causes of increased waist circumference (pregnancy, abdominal wall edema, anasarca, uncorrected hypothyroidism, Cushing syndrome), psychiatric disorders interfering with the ability to fill the food frequency questionnaire, refusal to participate. The study was approved by the local ethics committee and subjects signed an informed consent. Variables: age, sex, environment, BMI, waist, blood glucose, HDL cholesterol, triglycerides, blood pressure, glomerular filtration rate, HMW adiponectin, visfatin, PCR, IL6, IL10, insulin and food pyramid.
A protocol was developed for the evaluation of the patient with abdominal obesity, which contains the nutritional, the metabolic, and the immunologic and hormonal evaluation. Each subject filled-in a food frequency questionnaire, was measured and weighted, had his blood pressure taken and a venous blood sample was drown after minimum 8 hours fasting.
For the nutritional evaluation a web-based application was designed, containing the FFQ, general data and the metabolic evaluation. The questionnaire was developed based on the one used in the NHANES III evaluation and it was adapted to local dietary preferences. It contains 126 items grouped in major food types (cereal, fruits and vegetables, dairy, meat and proteins, fat and concentrated sweets). For r each item 1/10 frequencies is chosen and the application returns the personal food pyramid, individualized dietary recommendations and the metabolic evaluation. Data collection use the M.O. Excel and for the statistical analysis GraphPad prism v. 5 and SPSS with a level of significance of α=0.05.

Results
The subjects were mostly female (83.38%) and came from urban areas (66.47%). The anthropometric analysis shows that the majority of subjects were overweighed or with grade I obesity (63.03%) and just 11.17% (n=39) had a normal body mass index.
Nutritional evaluation – When comparing the mean food pyramid with the ideal one, the subjects included consumed significantly higher amounts of sweets, fat, meat and fruits and vegetables, and

lower amounts of dairy and cereal. The influence on waist and BMI was calculated for each food group, finding significant correlations with the concentrated sweet (r=(-0,25),(-0,35-(-0,15)), p<0,001). In the Multiple linear regression model, the food pyramid explains 5.6% of the waist variability. There is a moderate negative correlation between sweets and age (r= (-0, 34), (-0, 43-(-0, 24), p<0,001).

Metabolic evaluation – 16.82% of the subjects had simple abdominal obesity with no metabolic dysfunction. The prevalence of metabolic dysfunctions varied from 72.56% for hypertension and 36.9% for hyperglycemia; the great majority hadn't been previously diagnosed and were not receiving treatment (61.24% of the low HDL cholesterol and 30.09% of the hypertensive subjects). Waist circumference is significantly correlated with all metabolic factors, with a coefficient of determination of maximum r^2=0.23 for triglycerides. When using ROC curves for estimating the metabolic factors analyzed from the waist circumference values of ~70% were found for blood glucose and triglycerides. Multiple linear regression models were constructed finding the greatest quota of determination for triglycerides (r^2=0.24) explained mostly by the waist and the blood glucose. There was no significant correlation between the metabolic parameters and each food group taken separately. If the subjects are divided based on having been previously treated, they eat lower amounts of all food groups, significant for sweets (p=0.001) and cereal (p=0.02). The food pyramid elements explain 6% of triglycerides' variation, 3.8% of the HDL cholesterol, 4.8% of the blood glucose and 7.7% of the blood pressure.

The immunologic and hormonal evaluation – The analysis of a hemodyalised group of patients compared to control showed significant higher values for CRP, IL6 and adiponectin with low insulin, IL10 and visfatin. Waist circumference is significantly correlated with insulin and adiponectin (r= 0, 34, respectively (-0, 37), p<0.05).

The efficacy of the proposed evaluation protocol has a sensitivity of 88.3% with a negative predictive value of 92.9%. The food pyramid insures a sensitivity of 82.91% for the glucose metabolism dysfunction, highly significant (p=0.006).

Conclusions

Abdominal obesity is associated with multiple metabolic dysfunctions even in patients with normal body mass index. Dietary evaluation can identify models that have a role in the occurrence of glucose metabolism dysfunctions. The web-based nutritional assessment tool is easy to use and offers visual and clear information on dietary habits and the metabolic evaluation of subjects. Diet components explain a low percentage of the metabolic parameters variation in subjects with abdominal obesity. The proposed protocol for the evaluation of subjects with abdominal obesity has high sensitivity for the associated metabolic dysfunctions. Hemodyalised patients with abdominal obesity have a different adipokine profile than the one described for the whole group of end-stage renal disease subjects, regarding visfatin and insulin.

Keywords: abdominal obesity, food pyramid, metabolic dysfunction, diagnostic efficacy.