Impacts of nutrition and age on the angiological state

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Abstract: Nutritional impacts on the angiological state of 54 random patients of an ambulance case study have been studied. Body Mass Indices (BMI) and age (Year) has been correlated with the General Angiological State (GAS) of the patients. The results obtained support a conclusion, that human nutrition – especially BMI increment - represents a characteristic stress factor in relation with vascular diseases. Within the patients, gender impacts have been evaluated. Correlations were found between overweight state and the severity of vascular diseases in case of patients. It can be stated, that over-weight and obesity, especially in male population is a major stressor that may have an influence on vascular diseases. Age proved to be a strong factor in vascular disease performance and could be observed in both genders. The strongest correlation with age was found in the state of the female lot.

Keywords: Angiological state, nutrition, Body Mass Index

Introduction

Nutrition is a major source of most human health problems (Banczerowski et al, 2008; Szentpétery et al, 2002). Dietary patterns of the population often results in overweight or obesity (Lugasi and Marton 2010; Marton et al. 2012). Obesity is a serious medical condition that can cause complications such as metabolic syndrome, high blood pressure, atherosclerosis, heart disease, diabetes, high blood cholesterol, cancers and sleep disorders. Several authors have reported, that vascular diseases are often related to nutrition as well as to the age of patients (Romeo et al, 2008; Yuemang et al, 2006). Microvascular dysfunction in human hypertension has been reported by Poirier et al. (2006), and Kádár (2008). Angiological state of the population is being observed by various methods (USP, 2004, Michel 2008). In most countries objective measurement methods are combined with empirical observations.

The risks of improper human over nutrition on the circulatory system are as follows: Raised BMI increases the risk of hypertension (high blood pressure), which is itself a risk factor for coronary heart disease and stroke and can contribute to other conditions such as renal failure. The risk of coronary heart disease (including heart attacks and heart failure) and stroke may be both substantially increased. Risks of deep vein thrombosis and pulmonary embolism are also increased (Poirier et al. 2006).

The present study focuses on the presence of vascular diseases in relation with nutritional patterns and age of patients.

Materials and methods

Nutritional impacts have been studied in a random population within a case study run at the Railway Health Care Company Budapest in 2016 following the methodology of an earlier study of Ross et al. (2009). 54 patients have been studied within an age range of 33 to 92 years. Age, Body Mass Index (BMI) and General Angiological State (GAS) were evaluated in general and in relation with gender of patients. Statistical analyses have been applied in accordance with statistical evaluation package of Microsoft Office 2003.

General angiological state (GAS) has been determined by a 1-7 ranking as follows:

- Three angiological diseases + diabetes 7
- Three angiological diseases 6
- Two angiological diseases + diabetes 5
- Two angiological diseases 4
- One angiological disease + diabetes 3
- One angiological disease 2
- Normal state 1

The three vessels' diseases observed were as follows: carotic artheric stenosis, coronaria stenosis, and peripherial arterial disease PAD. BMI and GAS, as well as age and GAS relations have been evaluated by regression analysis.

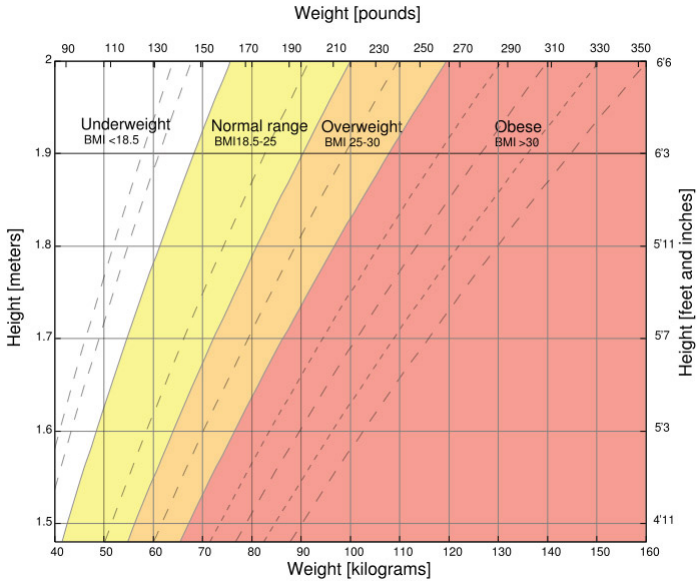

Figure 1. Body Mass Index (BMI). source WHO 2012

Results and discussion

The baseline data of patients, gender, age, BMI and GAS are presented in *Table 1*. The performance of patients was within a wide range in relation with these characteristics.

General Angiological State (GAS) of patients was gradual regarding the number and severity of vascular diseases and their combination with diabetes. BMI, GAS and age were evaluated both in general, and in relation with gender of patients. Gender ratio of the observed patients was 26 females and 28 males. Age range of the population was within 33 and 92 years. BMI range was 16.8 to 40.1 from which the following distribution was observed. Under-weight (<18.5): 3.7 %; normal (18.5-25.0): 42,6 %; over-weight (25.5-30.0): 37.0 %; obese (>30) 16.7 % as presented in *Figure 4*. The severity of angiological

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state is as follows: normal and/or a single disease (GAS 1-2) is 20.3 %, medium (GAS 3-5) is 57.4 %, serious state (GAS 6-7) is 22.3 %.

Table 1. GAS ratings of studied cases in relation with BMI, gender and age

No	Gender (male/ female)	age (year)	BMI (body mass index)	GAS rating (general angiological state) 1-7
1	Male	72	20.7	4
2	Male	62	40.1	7
3	Female	63	20.5	4
4	Female	67	24.9	4
5	Female	88	22.8	6
6	Female	83	23.2	6
7	Female	62	33,8	2
8	Male	66	25,7	5
9	Male	73	32.2	7
10	Male	80	25.5	5
11	Male	70	28.0	2
12	Male	64	30.7	4
13	Male	74	20.2	3
14	Female	74	29.8	4
15	Female	77	30.1	5
16	Female	70	26.8	7
17	Male	56	29.7	4
18	Male	83	25.2	5
19	Female	77	23.0	6
20	Male	83	25.2	5
21	Male	68	28.0	1
22	Male	66	26,9	5
23	Male	77	35.4	4
24	Female	86	22.2	4
25	Female	73	26.2	4
26	Female	75	16.8	6
27	Male	72	25.5	5
28	Male	64	24.3	4
29	Female	70	27.3	6
30	Female	70	30.1	5
31	Female	80	28.3	6
32	Male	82	24.7	5
33	Male	72	28.6	7
34	Male	66	27.7	6
35	Female	82	24.8	5
36	Male	80	29.4	5
37	Male	72	30.1	4
38	Male	63	27.1	2
39	Female	82	23.5	4
40	Female	92	22.9	4
41	Female	75	23.8	4
42	Male	78	29.1	4
43	Male	78	24.2	2
44	Female	71	19.2	5
45	Female	64	18.0	4
46	Female	73	25.1	2
47	Male	76	23.9	4
48	Female	65	18.7	2
49	Male	87	24.2	3
50	Male	74	23.5	2
51	Female	33	21.6	1
52	Male	36	24.2	1
53	Female	67	36.2	4
54	Female	67	24.2	1

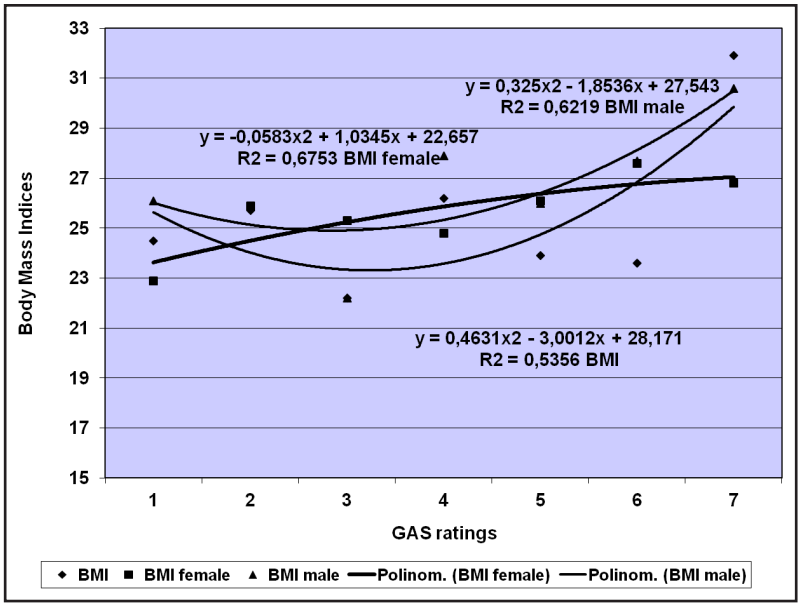

Figure 2. BMI and gender impacts on Generel Angiological State GAS performance

A statistical analysis is presented in *Figure 2* and *Figure 3* evaluating the performance of GAS in relation with nutrition patterns resulting in various levels of body mass like under-weight, normal state, over-weight and obesity and age of patients regarding both genders. The results obtained support the evidence that human nutrition – especially BMI increment - represents a peculiar stress factor in relation with vascular diseases. Correlations were found between overweight and the severity of vascular diseases in general, and in case of both sexes. Male patients had a specific pattern of this correlation, since the trend line of the BMI increment was almost linear in their case. Age of patients was in accordance with the general angiological state in both genders however vascular problems were increased significantly in the female lot with the strongest correlation.

Conclusions

Nutritional patterns of the human population may have an impact on health conditions. In the present study the General Angiological State (GAS) was evaluated within a random population regarding gender, age and obesity. Three vascular diseases - carotic artheric stenosis, coronaria stenosis, peripherial arterial disease PAD - and their combination with diabetes have been studied in correlation with BMI. It can be stated, that over-weight and obesity, especially in male population is a major stressor that may have an influence on vascular diseases as it was reported by Poirier et al. (2006). Age proved to be a strong factor in vascular disease performance and could be observed in both genders. The strongest correlation with age was found in the state of the female lot. The results obtained have similarities with that of the survey of Ross et al (2009). There was only one detectable difference between the recent study and that of the 2008 year. The range of BMI proved to be broader and the number of over-weight and obese patients was increased.

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Further studies are needed to explore nutritional interactions in relation with causes of obesity. Also, broader sampling of future case studies is needed to precise the results obtained.

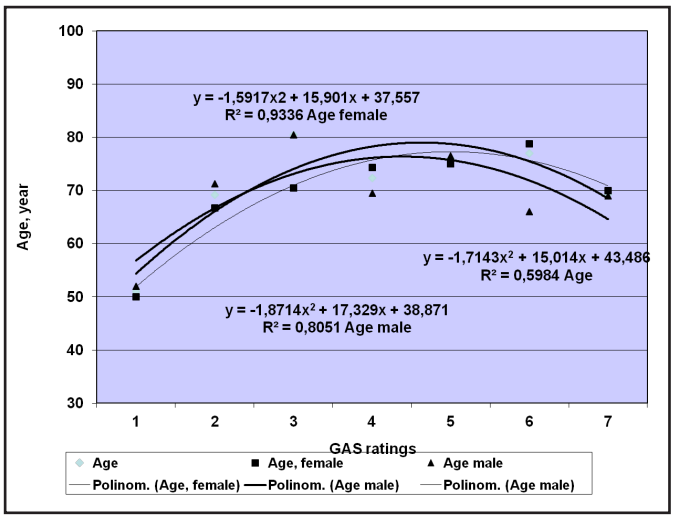

Figure 3. Age and gender impacts on Generel Angiological State GAS performance

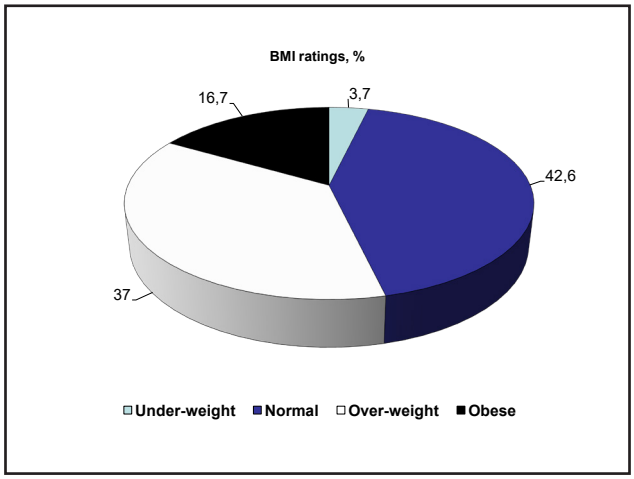

Figure 4. Distribution of BMI ratings

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