

## Serum Glucose Levels and Total Protein Profile in Danube Delta Patients with Fish Diet

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### Abstract

According to literature data, it is recommended that 50% of daily calories come from carbohydrates and recommended protein requirement is 0.8 to 1-1.25 g/kg/body/day. 200 grams of fish provides almost 25% of your daily protein requirement for an adult. It is an important source of protein with high biological value, containing all essential amino acids. The aim of this study was to analyze the benefits of a fish diet among the population of Sulina Town, in the Danube Delta. The batch of patients underwent a set of biochemical tests in the RoutineMed Laboratory of Sulina and they are considered healthy. The novelty of the research is represented by the geographic area covered, as the Danube Delta had no medical analysis laboratory until 2010, when RoutineMed Laboratory was opened in Sulina. Blood samples were collected from 230 patients for the evaluation of the serum glucose levels and total protein. Both women and men were involved in the research and patients were grouped into age ranges: 20-40 years, 40-60 years, > 60 years. The study included 230 patients, 100 male and 130 were female, who declared they eat fish or fish-based products at least once a week.

The values obtained were statistically analyzed using the SPSS v. 20 software and then compared to the ranges considered normal for these parameters. The results obtained showed that patients with a fish-based diet seem to be healthier than those with a diet in which fish meat is scarce, as their blood biochemical parameters values are closer to normal, which leads to the conclusion that including fish and fish products in people's regular diet is beneficial in preventing protein and carbohydrate metabolism disorders and preserving the overall health.

**Keywords:** Sedum, organogenesis, callus, blue fluorescent light

## Material and Methods

Blood was collected and analyzed at medical analysis laboratory Routine Med Sulina. For serum biochemistry were used following measuring instruments: automatic biochemistry unit SAPHIRE 350, centrifuges Rotofix 32 A and reagents Audit Diagnostics ( Procedura specifică- determinări de biochimie, 2013).

The experimental data were processed using IBM SPSS Statistics 20. The procedures used were: Descriptive statistics (characterization variables discrete and continuous defined in the database), Graphs, Statistical tests parametric (t-test to compare the average of two independent samples, t-test to compare the average of a sample value specified test One-Way ANOVA), correlation analysis (Ene, 2017).

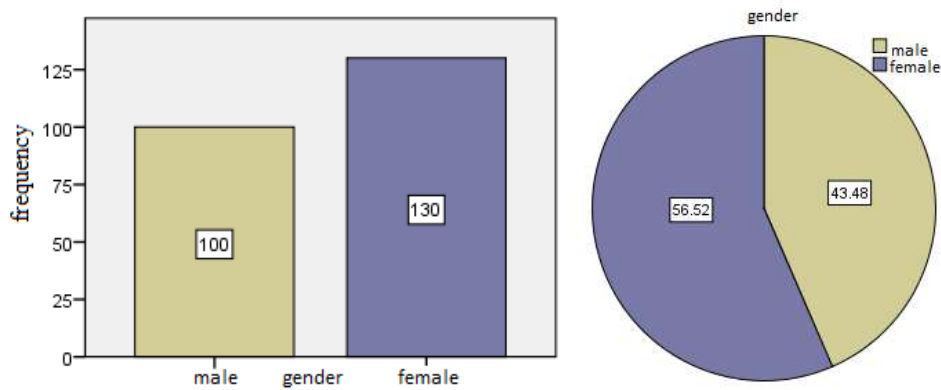
## Results and Discussion

The study included 230 patients, 100 were males (43.48%) and 130 were females (56.52%) (Figure 1). The distribution by age groups on male was: 18 were in the age range (20-40) years, 44 were in the age range (40-60) years and 38 were in the age range (60 -...) years. The distribution by age groups on female was: 51 were in the age range (20-40) years, 43 were in the age range (40-60) years and 36 were in the age range (60 -...) years (Figure 2).

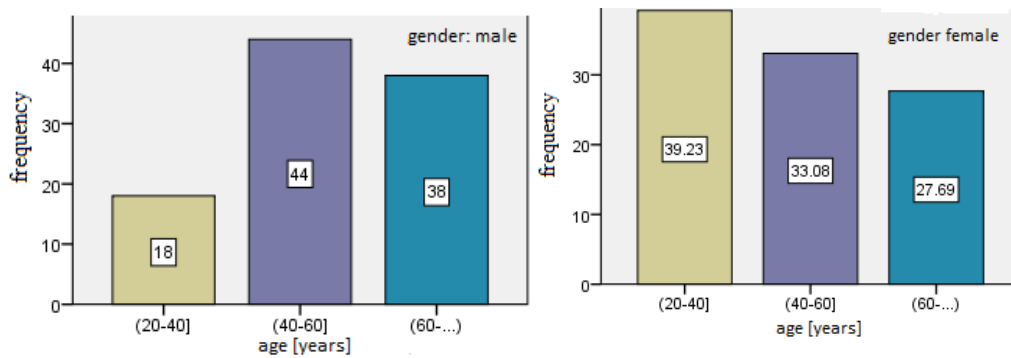
Glucose metabolism can be altered by several mechanisms: the inability of pancreatic beta cells to secrete insulin, insulin receptor number reduction, intestinal malabsorption of glucose, the inability of the liver to metabolize glycogen, changing hormones involved in metabolism of glucose concentration (Fischbach, 2009).

Criteria for ADA (American Diabetes Association) for the diagnosis include:

- Suggestive symptoms (polyuria, polydipsia, unexplained weight loss) plus a "random" glucose value  $\geq 200$  mg / dL ( $\geq 11.1$  mmol / L) or
- The fasting glucose  $\geq 126$  mg / dL ( $\geq 6.99$  mmol / L) or
- Blood glucose  $\geq 200$  mg / dL 2 hours after administration of 75g glucose (in the glucose tolerance test) (ADA, 2010).



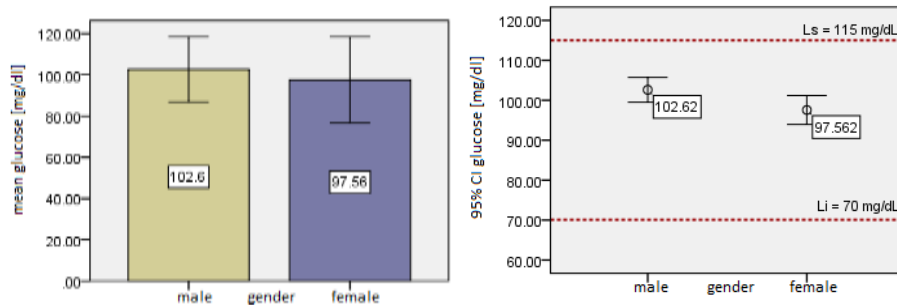
**Figure 1:** The distribution by gender and percent



**Figure 2:** The distribution by age groups on male and female

**The average value of glucose :** For male patients ( $N = 100$ ) the mean of glucose is  $M_M = 102.6 \text{ mg / dL}$  For female patients ( $N = 130$ ) the mean of glucose is  $M_F = 97.56 \text{ mg / dL}$ .

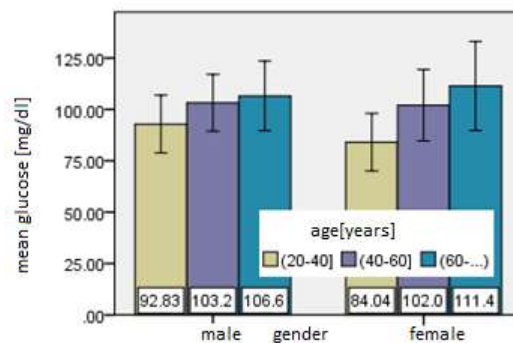
When the mean of glucose are compared in the two groups of patients with a reference value  $L_{\text{sup}} = 115 \text{ mg / dL}$ : for the group of male patients average amount of glucose -  $M_M = 102.62 \text{ mg / dL}$  and for the group of female patients average amount of glucose -  $M_F = 97.56 \text{ mg / dL}$  indicate that both women and men results are within normal limits ( Figure 3).



**Figure 3:** Mean glucose on male and female

*The average value of glucose - Males:* For the group (20-40] years (N = 18) the average of glucose is  $M_{(20-40]} = 92.83$  mg / dL; in group (40-60] years (N = 44) the average value of the glucose is  $M_{(40-60]} = 103.2$  mg / dL; in the group (60- ...] years (N = 38) the average value of the glucose is  $M_{(60-...]} = 106.6$  mg / dL.

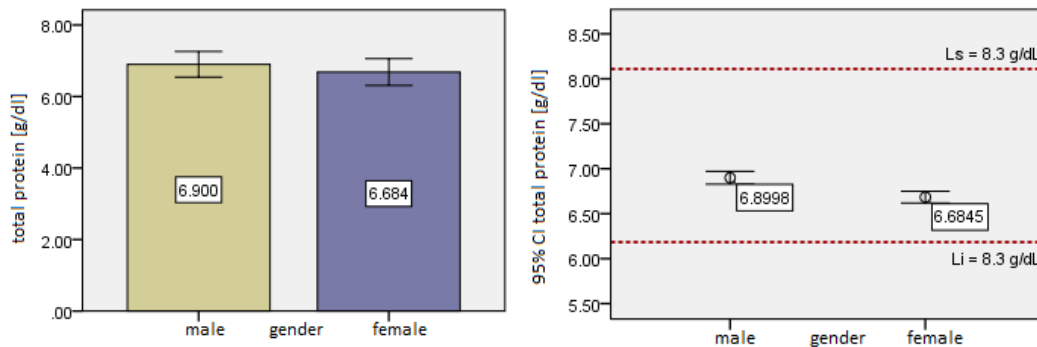
*The average value of glucose - Females:* For the group (20-40] years (N=51) the average of glucose is  $M_{(20-40]} = 84.04$  mg / dL; in group (40-60] years (N = 43) the average value of the glucose is  $M_{(40-60]} = 102.0$  mg / dL; in the group (60- ...] years (N = 36) the average value of the glucose is  $M_{(60-...]} = 111.4$  mg / dL. (Figure 4).



**Figure 4:** Mean glucose on male and female by age groups

***The average value of total protein :*** For male patients (N = 100) the mean of total protein is  $M_M = 6.90$  g / dL. For female patients (N = 130) the mean of total protein is  $M_F = 6.68$  g / dL.

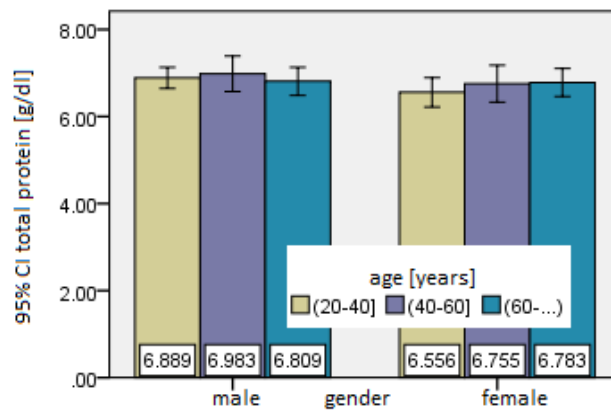
When the mean of total protein are compared in the two groups of patients with a reference value  $L_{sup} = 8.3$  g / dL: for the group of male patients average amount of total protein -  $M_M = 6.90$  g / dL and for the group of female patients average amount of total protein -  $M_F = 6.68$  g / dL indicate that both women and men results are within normal limits ( Figure 5).



**Figure 5:** Mean total protein on male and female

*The average value of total protein - Males:* For the group (20-40] years (N = 18) the average of total protein is  $M_{(20-40]} = 6.88 \text{ g / dL}$ ; in group (40-60] years (N = 44) the average value of the total protein is  $M_{(40-60]} = 6.98 \text{ g / dL}$ ; in the group (60- ...] years (N = 38) the average value of the total protein is  $M_{(60-...]} = 6.80 \text{ g / dL}$ .

*The average value of total protein - Females:* For the group (20-40] years (N=51) the average of total protein is  $M_{(20-40]} = 6.55 \text{ g / dL}$ ; in group (40-60] years (N = 43) the average value of the total protein is  $M_{(40-60]} = 6.75 \text{ g / dL}$ ; in the group (60- ...] years (N = 36) the average value of the total protein is  $M_{(60-...]} = 6.78 \text{ g / dL}$  (Figure 6).



**Figure 6:** Mean total protein on male and female by age groups

## Conclusions

The results obtained showed that patients with a fish-based diet seem to be healthier than those with a diet in which fish meat is scarce, as their blood biochemical parameters values are closer to normal, which leads to the conclusion that including fish and fish products in people's regular diet is beneficial in preventing protein and carbohydrate metabolism disorders and preserving the overall health.

It is recommended that 50% of daily calories come from carbohydrates, with an emphasis on complex carbohydrates consumption without contraindications simple carbohydrate consumption.

Reducing protein intake influences lean mass, immune response and muscle function, delaying wound healing and prolong convalescence (Ghid pentru alimentația sănătoasă, 2006).

When come into human food, fish eggs and their body bring real health benefits. Both fish meat and eggs, are considered by many nutritionists, the healthiest food of animal origin.

Reasons to choose white meat:

- It has a high concentration of superior proteins; 200 grams of fish provides almost 25% of your daily protein requirement for an adult and 50-75% of the daily ration needed by a child or a pregnant woman;
- Ensure increasing levels of vitamins (A, D and the B complex) and mineral elements such as phosphorus, potassium, magnesium, selenium, iron, copper, iodine and fluorine );
- It is rich in Omega 3 fatty acids, those with multiple roles in the body fat (from nervous system functioning, maintain healthy heart etc.).
- Fish meat is comparable to the meat of other animals in terms of composition; is easier to digest than meat from mammals and birds as it contains collagen fibrous tissue (Mencinicopschi,2007).

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