



Is there Any Relation between the Age of Patients and the Length of the Small Bowel? How Long is your Patient's Bowel?

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Introduction

The causes of bowel resections are very frequent. This can result in the onset of short bowel syndrome (SBS), clinical picture characterized by serious malabsorption. Diarrhea, malnutrition, weight loss, dehydration and electrolyte deficit require in some patients nutritional support for life [1-3].

SBS is defined by the 70 to 75% loss of the length of the small bowel or a bowel remnant less than 200cm, but how long is really the small bowel in the living patient? [1-5].

Authors describe that the human small bowel has lost length in its evolution, with dietary changes. The small bowel is a metabolically expensive tissue, the consumption of processed food has changed its physiology, pursuant to the already published by Aiello and Wheeler in 1995 in "expensive tissue hypothesis" [5]. We could not find trials relating the age of patients with the length of the small bowel [6-8]. Most anatomical and physiological descriptions state a length of 7, 8, and even 10 meters [7-12].

Purposes of the Study

- Measure the length of the small bowel in the living patient.
- Study the ratio between the age of the patient and the length of the small bowel.
- Study the ratio between weight, height, body mass index and bowel length.

Material and Methods

We analyzed 36 male patients; 29 white, 1 mixed race and 6 black, ranging from 16 to 78 years, treated at the Emergency Room of Hospital Pasteur, during the period of December, 2012 to No-

vember, 2013, submitted to exploratory laparotomy due to urgent, non-inflammatory, non-obstructive pathology, mostly penetrating abdominal wounds, in hemodynamically stable patients, with normal preoperative paraclinical studies. Always with the same surgical team, with prior consent and information of all patients. This is made within the routine abdominal examination.

The measuring of the small bowel was made as part of this abdominal examination from the duodeno-jejunal angle to the ileocecal valve with a 75-cm standard linen string 2-0, this proceeding was made always in less than 5 minutes, always progressively in the small bowel, by the anti-mesenteric edge thereof. The study variables were age, weight, height, BMI, bowel length as well as ratios among these variables. P less than 0.05.

Statistical analysis

- Quantitative Methods Department, Medicine Faculty
- Anaulina Silveira, Biostatistical BS.
- A 36-men analysis was carried out within the research work.

The following table shows the minimum and maximum values relating to age, weight and height variables, as well as the calculation of the average with its corresponding standard error (Table 1).

The variable of weight is in Kg and height in cm.

For the BMI, according to WHO, classified as follows: (Table 1)

Regarding race of males analyzed, it was observed that 80.6% of the cases (29 patients) were white, 16.7% (6 patients) were black and one patient was of mixed race.

	Minimum	Maximum	Average	
	Stat.	Stat.	Stat.	Std. Error
Age	16.00	78.00	35.7778	3.16005
Weight	56.00	90.00	71.4444	1.34486
Height	150.00	185.00	171.8611	1.31786

Table 1

	Absolute F.	Rel. F. %
Normal	21	58.3
Obese	1	2.8
Overweight	14	38.9
Total	36	100.0

Table 2

The following data correspond to a minimum, maximum, average +/- EE for the length of the bowel (cm).

	Minimum	Maximum	Average	
	Statistic	Statistic	Statistic	Std. Error
Length_bowel	345.00	700.00	499.0833	15.47047

Table 3

Regarding the hypothesis that older the age, longer the intestine, Pearson correlation coefficient is calculated, r gave 0.754. This demonstrates a positive correlation between both variables, when one of them increases, the other one increases as well.

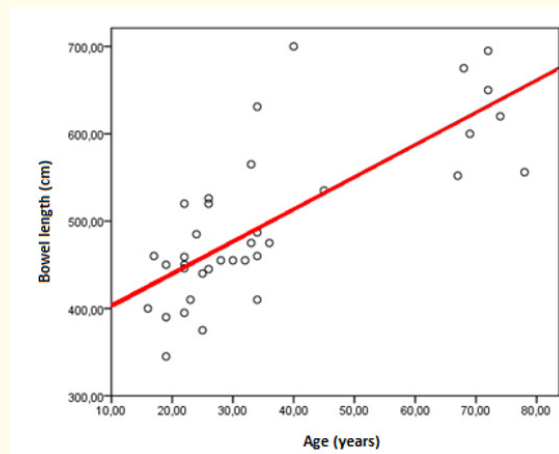


Figure 1

If we study the ratio between the height of the individual and the length of the bowel, we observe that no ratio is statistically stated.

r coefficient gave a value of -0.255.

The following plot shows the no-ratio statement.

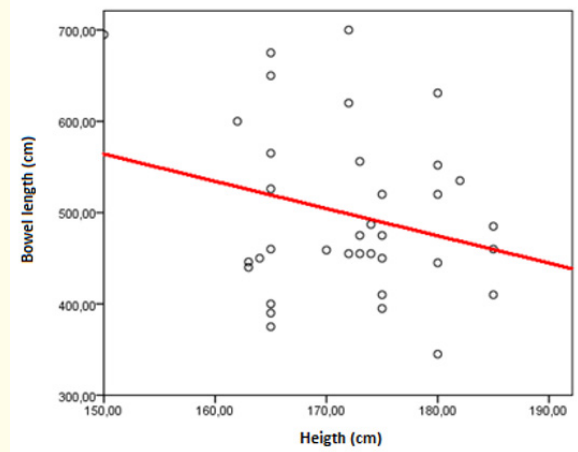


Figure 2

If we study the ratio between the weight of the individual and the length of the bowel, we observe that no ratio is statistically stated.

r coefficient gave a value of 0.407.

The following plot shows the no-ratio statement, or what would be more correct, a very small positive ratio. After calculating the statistical test for studying the strength of this ratio, the same gave $p = 0.079$, which is not significant.

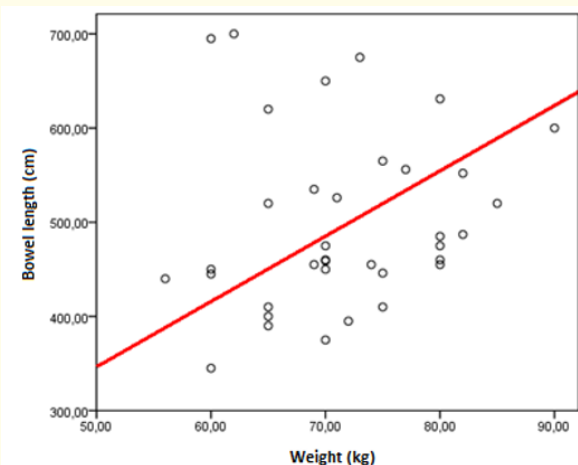
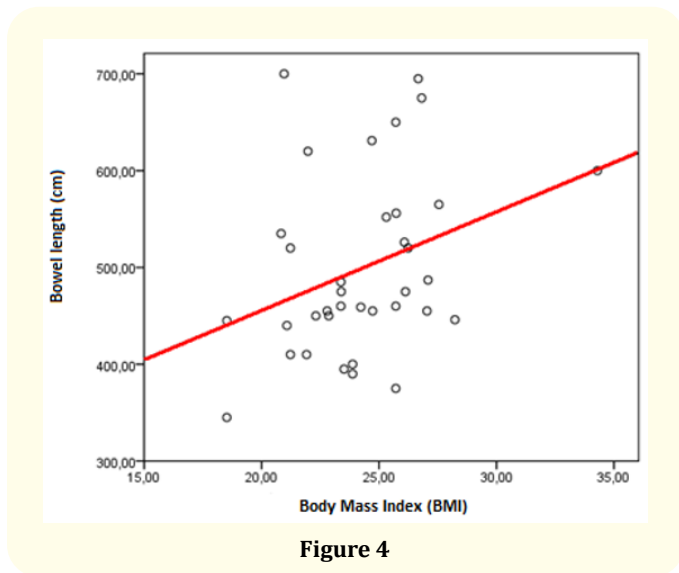


Figure 3

We study the ratio between the IMC of the individual and the length of the bowel, we observe that no ratio is statistically stated.

r coefficient gave a value of 0.326.



Results

Average length of the small bowel: 499.0833 cm with a range of 345.00 cm to 700.00 cm.

Hypothesis: older the age, longer the intestine. Pearson correlation coefficient is calculated, r gave 0.754. This demonstrates a positive correlation between both variables, when one of them increases, the other one increases as well. p less than 0.05.

There was no statistical significance between weight and height and the length of the bowel.

r coefficient for height, value of 0.255, r coefficient for weight, value of 0.326. Which are statistically no significant.

Discussion

We made a Descriptive-Clinical trial; this is novel in our environment since we did not find in the national literature any trial assessing the variables of our trial as well as its analysis in living and healthy patients, in our environment.

We made a literature research in the Medicine Faculty Library and the Uruguay Surgery Society Library, as well as research on the Internet databases.

Neither did we find trials studying the ratio between the bowel length and the age of patients, particularly in adults and in trials with *in vivo* measurements, with no extreme physiological modifications such as transplant procedures, explant procedures, or measurements in corpses or anatomical preparations [9,11-16].

Our trial measured the length of the small bowel and studied the ratios between this and the other variables only in men, consequently new trials including women groups, and greater amount of obese and overweight patients will be probably necessary for assessing these variables with the length of the bowel.

In later studies, patients from different social classes and with different type of feed shall be assessed, since in our trial most patients are in their normal weight range.

The detailed statistical analysis of the study of the age and bowel length variables as well as adding the ratio with BMI and other variables, make this trial a novel investigation and starting point for new trials.

On average, the small bowel measured 499.0833 cm, less than what has been published in the classic literature [17-20]. This may be because the measurement in corpses when losing muscle tone would overestimate the length thereof.

Conclusion

- On average, the small bowel measured 499.0833 cm.
- We proved that older the age, longer the small bowel.
- We did not find statistical ratio between weight or height and the length of the small bowel.

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