

# Correlation between Age of Subjects and Length of the Appendix in Bundelkhand Region of India.

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## ABSTRACT

**Background:** The aim of present study is to note the correlation of appendix length with age in both genders in patients of acute appendicitis from Bundelkhand region. **Methods:** This observational study was carried out on 100 patients belonging from Bundelkhand region of India, suffering from Acute Appendicitis. The patients were divided into groups based on their genders and ages. Measurement of length of the appendix was taken from base to tip. All the findings were tabulated and inferences were drawn followed by statistical comparison using t-test and ANOVA with p value <0.05 considered as significant. Regression analysis was done to note the correlation between age of the subject and length of appendix in both genders. **Results:** A highly significant positive correlation was noted between ages of patient with the length of the appendix. This positive correlation was seen in both genders. **Conclusion:** The data of the present study may provide a baseline in the standardization of the anthropometric information regarding the length of vermiform appendix of Bundelkhand population.

**Keywords:** appendix, appendix length, regression analysis, Bundelkhand, correlation.

## INTRODUCTION

The appendix is a diverticulum of caecum, which appears in the 6th week of embryonic life as a swelling on the anti-mesenteric border of the mid-gut loop. The position and length are attained by rapid helicoidal differential growth of the lateral and anterior position of the caecum with displacement of the appendix posteriorly and medially.<sup>[1]</sup> This worm-like intraperitoneal process extends from the caecum usually in a posteromedial direction. Since it is derived from the developing colon, the appendix can be located by tracing the taenia coli to the base of the appendix where the taenia coli form a complete smooth muscle layer of the appendix.<sup>[2]</sup> It is located in the right lower quadrant of the abdomen<sup>[3,4]</sup> appearing as a narrow worm like tube arising from the postero-medial aspect of the caecal wall 2cm or less below the end of the ileum.<sup>[3,4]</sup> The tip of the appendix can be located anywhere in the right lower quadrant of the abdomen, pelvis, or retroperitoneum.<sup>[5]</sup>

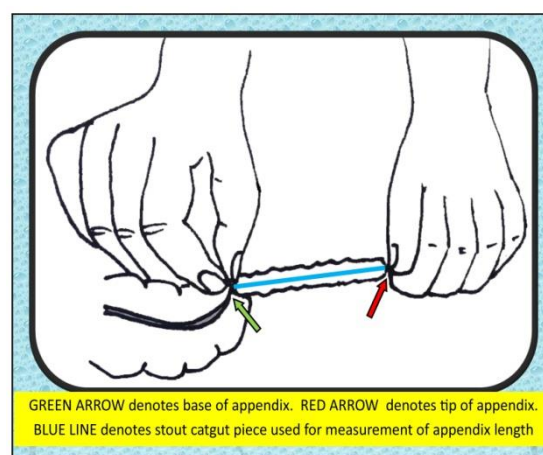
Pradesh on 100 patients over a period of evaluation from October 2013 to October 2015 with ethical approval. Patients belonging to other regions were not included in this study. Measurement of length of the appendix was done using a stout chromic catgut from base to tip [Figure-1] before removal of the appendix followed by measurement of that piece using a Vernier calliper accurate up to 0.1 mm. The base of the appendix was identified where the taenia coli on the ascending colon and caecum converge. The anterior caecal taenia coli is usually distinct and traceable to the appendix, affording a guide to it.<sup>[6]</sup> Data were classified into groups on the basis of age and gender. All the findings were tabulated and statistical comparison was done with the help of "Statistical Calculator v 4.0" using suitable tests viz. Regression analysis, one way ANOVA and unpaired t-test with p value <0.01 considered as significant

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## MATERIALS AND METHODS

This observational study was carried out on patients of Bundelkhand region of India, suffering from Acute Appendicitis admitted in Department of surgery, Rajkiya Medical College, Jalaun, Uttar Pradesh and Siddhi Vinayak Hospital, Jalaun, Uttar



**Figure 1:** Line diagram showing method of measuring the length of the appendix.

**RESULTS**

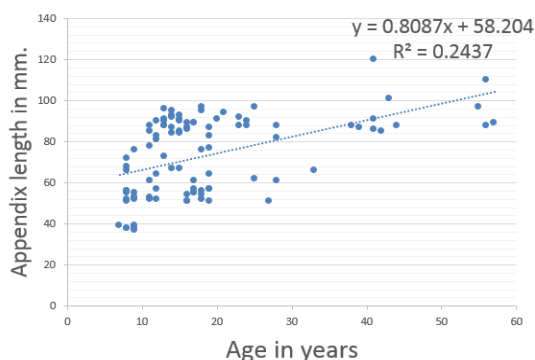
**Table 1:** Age and gender distribution of patients with acute appendicitis.

Age group in years	Number of patients			Percentage (%)
	Males	Females	Total	
0-10	12	8	20	20
11-20	34	22	56	56
21-30	8	3	11	11
31-40	0	3	3	3
41-50	3	3	6	6
>50	3	1	4	4
Total	60	40	100	

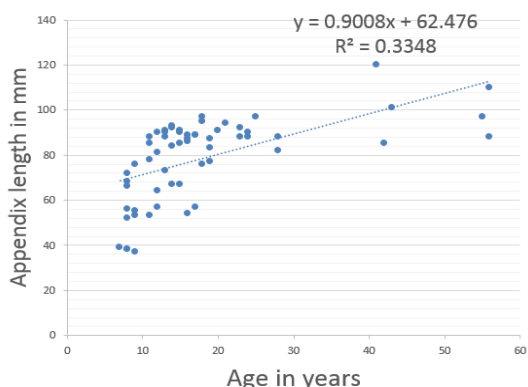
**Table 2:** Mean appendix length in various age groups.

Age group in years	Mean length of appendix in millimetres		
	Males (n=60)	Females (n=40)	Overall (n=100)
0-10	54.17 ±14.09	47.75 ±7.96	51.6 ±12.19
11-20 <sup>#</sup>	81.29 ±12.49	66.14 ±16.86	75.34 ±16.06
21-30	82.75 ±16.74	77 ±14.18	81.18 ±15.61
31-40	NA	80.33 ±12.42	80.33 ±12.42
41-50	102 ±17.52	88.33 ±2.52	95.17 ±12.3
>50	98.33 ±11.06	NA	96 ± 10.16

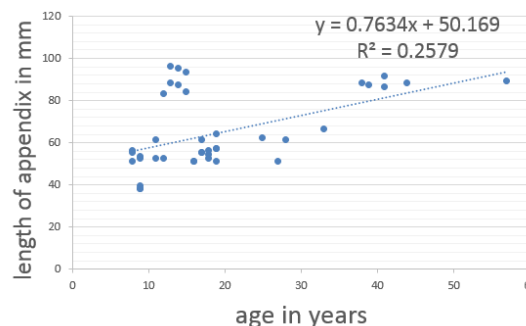
<sup>#</sup>This age group showed significant difference in appendix length in between both genders



**Figure 2:** Scatter diagram with regression analysis showing correlation between the age of subjects and length of the appendix.



**Figure 3:** Scatter diagram with regression analysis showing correlation between the age of the male subjects and the length of the appendix



**Figure 4:** Scatter diagram with regression analysis showing correlation between the age of the female subjects and the length of the appendix.

**DISCUSSION**

In the present study, the highest prevalence of acute appendicitis was found in the age group of 11-20 years age group in both genders. [Table-1]. The highest mean length of the vermiform appendix was found in 41-50 years age group in both genders. [Table-2].

Average length of the appendix was 78.9 ± 18.1 mm ranging from 37 mm to 120 mm in males, while its length ranged from 38 mm to 96 mm in females with an average of 65.5 ± 17.5 mm. Average length of the appendix was found higher in males as compared to females similar to studies of other workers from different geological region. [7, 9, 10] This difference in mean appendix length between two genders was found to be statistically significant (p<0.001). Though some workers from other geological regions have reported female population showing higher length of appendix as compared to males [8, 11].

A positive correlation was noted between ages of patient with the length of appendix [Figure-2]. This correlation was seen in both genders. [Figure-3, 4] and it was also found statistically significant. A study on 210 acute appendicitis patients of childhood age group in Australia reported positive correlation between age of patient with the length of appendix only in <3 years age group. [12] They proposed that after an initial growth period during early infancy up to about 3 years, the appendix achieves its adult proportions and does not continue to grow throughout childhood. [12] In some other studies on 200 bodies from Iranian population [13] and 60 cadavers of the Sudanese population [14], they found a significant association between the appendix length and different age groups. They also reported that individuals with older age have a longer length of the appendix similar to the findings of present study. [13] Contrary to our finding one study in Bangladesh on 56 males reported no significant negative correlation between age of the subject and length of the appendix [15], while another study in Bangladesh on 60 postmortem cases showed a highly significant negative correlation between age of the subject and length of appendix. [16] The cause

of such gradual increment in appendix length with age in this study might be accounted to dietary habits and racial difference.

## CONCLUSION

A highly significant positive correlation was noted between ages of patient with the length of the appendix. This correlation was seen in both genders. The data of the present study may provide a baseline in the standardization of the anthropometric information regarding the length of vermiform appendix of Bundelkhand population.

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**How to cite this article:** Balram. Correlation between Age of Subjects and Length of the Appendix in Bundelkhand Region of India. Ann. Int. Med. Den. Res. 2016;2(3):151-53.

**Source of Support:** Nil, **Conflict of Interest:** None declared