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DISTRIBUTION, HISTOLOGY AND PATHOGENESIS OF INTESTINAL POLYPS

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ABSTRACT

Background: In children, gastrointestinal polyps are frequently discovered; juvenile polyps are the most prevalent type, occurring in almost 90% of the subjects. Juvenile polyposis syndrome affects 1 in 100,000–160,000 people. In juvenile polyps, mucosal eosinophilia is very important. To guarantee proper management and follow-up, a thorough understanding of these disorders is essential.

Aim: The purpose of this study was to determine the distribution and histology of intestinal polyps as well as the role that stromal eosinophilia plays in the pathophysiology of juvenile polyps.

Methods: Eighty-four children with gastrointestinal polyps were evaluated in this study. All subjects had their polyps' location, quantity, and size evaluated. Additionally, in individuals with juvenile polyps, the relationship between size/age and stromal eosinophilia was evaluated.

Results: Peutz Jeghers, inflammatory, multiple juvenile, and solitary juvenile polyps were found in six, six, four, and sixty-eight study subjects, respectively, according to the current study's findings. The rectum was the most common location for polyps, and the study participants' average age was 6.5 years. Eosinophilic infiltration was found to be positively correlated with polyp size and negatively correlated with juvenile polyp age.

Conclusions: The current study finds that solitary juvenile polyps account for the majority of gastrointestinal polyps observed in the child subjects. Significant eosinophilic infiltration of gastrointestinal polyps may indicate that allergies may play a part in the etiopathogenesis of juvenile polyps.

Keywords: Eosinophilic infiltration, gastrointestinal polyps, juvenile polyps, pediatric polyps, child subjects.

INTRODUCTION

The word "polyp" comes from the Greek word "polypus," which means "many feet." Any growth or excrescence that protrudes above the mucous membrane is referred to as a polyp. The majority of polyps observed in the children are typically isolated juvenile polyps. It is unclear exactly what causes gastrointestinal polyps in children.1

Previous research has shown that individuals with juvenile polyps have a higher incidence of stromal eosinophilia. Additionally, there is a dearth of information in the literature regarding the evaluation of eosinophilic infiltration in children with juvenile gastrointestinal polyps.2,3

The current study sought to evaluate the potential role of eosinophilic infiltration in the etiopathogenesis of gastrointestinal juvenile polyps, given the presence of eosinophils in subjects with juvenile polyps. The study also assessed different types of polypoidal lesions in subjects of pediatric age.

MATERIALS AND METHODS

The goal of the current clinical evaluation study was to evaluate the potential contribution of eosinophilic infiltration to the etiopathogenesis of juvenile gastrointestinal polyps. Additionally, the study evaluated various forms of polypoidal lesions in pediatric subjects. Prior to their involvement in the study, all participants provided written and verbal informed consent.

84 participants with confirmed clinical diagnoses of gastrointestinal polyps, both male and female, were evaluated for the study. Both polypectomy and bowel resection specimens were evaluated in the study. The location, quantity, mode of presentation, and demographic information of each participant were evaluated. Eosin and hematoxylin staining were used in the routine processing of histopathological specimens and samples.

Based on their size, the polyps under study were divided into three categories: less than one centimeter, between one and two centimeters, and more than two centimeters. The presence of more than 20 eosinophils per high-power field was considered significant eosinophilic infiltration in the polyp's lamina propria.

The collected data was statistically analyzed using the Student t-test, Chi-square test, ANOVA (analysis of variance), and SPSS. The mean, standard deviation, frequency, and percentages were used to express the results. A p-value of less than 0.05 was deemed statistically significant. Pearson's correlation was used to evaluate the relationship between each parameter concentration and DAS28.

RESULTS

The purpose of the current clinical evaluation study was to evaluate the potential contribution of eosinophilic infiltration to the etiopathogenesis of juvenile gastrointestinal polyps. Additionally, the study evaluated various forms of polypoidal lesions in pediatric subjects. 84 children with gastrointestinal polyps were evaluated in this study. The size, quantity, and location of the polyps were evaluated in each subject. 45.24% (n=38) of the 82 subjects evaluated in the study were female, and 54.76% (n=46) were male. The mean age was 6.5 years, and the age range was 2–12 years. Mass per rectum in rectal polyps, painless, and sporadic rectal polyps were the modes of presentation. Anemia, persistent rectal bleeding, and abdominal pain were symptoms of more proximally located polyps. Four individuals had intestinal obstruction as a result of intussusception.

Six subjects had rectal polyps, six had jejunal polyps, eight had colonic polyps, and four had ileal polyps, according to the study's findings. The study's polyps were categorized according to their histology. Six, six, four, and eight subjects with inflammatory polyps, Peutz Jeghers polyps, juvenile polyposis coli, and solitary juvenile polyps, respectively, had eosinophilic infiltration of less than 20/HPF. 0, 0, 0, and 60 individuals with inflammatory polyps, Peutz Jeghers polyps, juvenile polyposis coli, and solitary juvenile polyps, respectively, had eosinophilic infiltration of >20/HPF (Table 1).

Solitary juvenile polyps were observed in 80.9% (n=68) of the subjects. Additionally, polypoidal grey-white masses measuring between 0.5 and 1.5 cm were present. In an edematous and inflammatory lamina propria with an inflammatory infiltrate of histiocytes, plasma cells, eosinophils, lymphocytes, and neutrophils, the histopathological evaluation revealed the presence of several cystically dilated glands. 4.8% (n=4) of the subjects had multiple juvenile polyposis. The number of polyps was between 10 and 15, and they were dispersed throughout the colon. The histopathological characteristics were similar to those of isolated juvenile polyps. According to the study, 7.1% (n=6) of the subjects had Peutz Jegher's polyps, which were found in the ileum and jejunum in the range of 3-5. These lesions resembled cauliflower and were pedunculated. According to histopathology, polyps have mucosal lining covering smooth muscles arranged in an arborizing pattern. 7.1% (n=6) of the subjects had inflammatory polyps.

Histopathology revealed inflammatory infiltrates and a large amount of granulation tissue. Significant eosinophilic polyp infiltration was present in 60 of the 60 subjects who had juvenile polyps with four juvenile polyposis and 68 solitary juvenile polyps. Multiple juvenile polyposis did not exhibit eosinophilic infiltration. Significant eosinophilic infiltration was not seen in any subject with inflammatory or Peutz Jeghers polyps.

Juvenile polyp size to eosinophilic infiltration was measured in 68 subjects aged 2-12 years who had juvenile polyps. The results showed that eosinophilic infiltration <20/HPF was observed in 12 cases with 0, 2, and 10 cases of <1, 1-2, and >2cm, respectively, while eosinophilic infiltration >20/HPF was observed in 60 subjects with 8, 38, and 14 cases of <1, 1-2, and >2cm, respectively.

Of the 72 study participants, 8, 40, and 24 had tumor sizes of less than 1, 1-2, and more than 2 cm, respectively (Table 2). Eosinophilic infiltration <20/HPF was observed in 0, 0, 2, 4, 6, and 12 subjects in the age range of 2-4, 4-6, 6-8, 8-10, and 10-12 years, respectively. In the age range of 2-4, 4-6, 6-8, 8-10, and 10-12 years, respectively, 12, 16, 16, 12, 4, and 60 subjects had eosinophilic infiltration >20/HPF (Table 3). The eosinophilic index and growing age showed an inverse relationship (p=0.04). Additionally, a positive correlation (p=0.02) was observed between polyp size and the eosinophilic index.

DISCUSSION

The study's polyps were categorized according to their histology. Six, six, four, and eight subjects with inflammatory polyps, Peutz Jeghers polyps, juvenile polyposis coli, and solitary juvenile polyps, respectively, had eosinophilic infiltration of less than 20/HPF. 0, 0, 0, and 60 individuals with inflammatory polyps, Peutz Jeghers polyps, juvenile polyposis coli, and solitary juvenile polyps, respectively, had eosinophilic infiltration of >20/HPF. These results were similar to those of earlier studies by Fox VL et al. (2010) and Rosty C et al. (2013), in which the authors reported polyp distribution in study subjects comparable to the current study.

Solitary juvenile polyps were observed in 80.9% (n=68) of the subjects. Additionally, polypoidal grey-white masses measuring between 0.5 and 1.5 cm were present. In an edematous and inflammatory lamina propria with an inflammatory infiltrate of histiocytes, plasma cells, eosinophils, lymphocytes, and neutrophils, the histopathological evaluation revealed the presence of several cystically dilated glands. 4.8% (n=4) of the subjects had multiple juvenile polyposis. The number of polyps was between 10 and 15, and they were dispersed throughout the colon.

The histopathological characteristics were similar to those of isolated juvenile polyps. According to the study, 7.1% (n=6) of the subjects had Peutz Jegher's polyps, which were found in the ileum and jejunum in the range of 3-5. These lesions resembled cauliflower and were pedunculated. According to histopathology, polyps have mucosal lining covering smooth muscles arranged in an arborizing pattern. These results were consistent with those of Lee BG et al. and Rahat N6 where histopathological characteristics in subjects with GI polyps reported by authors correlated with results of present study.

Inflammatory polyps were found in 7.1% (n=6) of the subjects. Histopathology revealed inflammatory infiltrates and a large amount of granulation tissue. Significant eosinophilic polyp infiltration was present in 60 of the 60 subjects who had juvenile polyps with four juvenile polyposis and 68 solitary juvenile polyps. Multiple juvenile polyposis did not exhibit eosinophilic infiltration. Significant eosinophilic infiltration was not seen in any subject with inflammatory or Peutz Jeghers polyps. These findings were consistent with those of Gupta S et al. (2001) and Gurung P et al. (2014), who reported similar findings in their studies involving intestinal polyps in pediatric subjects.

Eosinophilic infiltration <20/HPF was observed in 12 cases with 0, 2, and 10 cases of <1, 1-2, and >2 cm, respectively, whereas eosinophilic infiltration >20/HPF was observed in 60 subjects with 8, 38, and 14 cases of <1, 1-2, and >2 cm, respectively. Of the 72 study participants, 8, 40, and 24 had tumor sizes of less than 1, 1-2, and more than 2 cm, respectively. These results were consistent with earlier research by Corredor J et al. (2001) and Durno C11 (2007). where the size of the polyp, as observed in this study, was positively correlated with eosinophilic infiltration, according to authors' earlier research. Eosinophilic infiltration <20/HPF was observed in 0, 0, 2, 4, 6, and 12 subjects in the age range of 2-4, 4-6, 6-8, 8-10, and 10-12 years, respectively, according to the evaluation of the correlation between eosinophilic infiltration and age in study subjects. In the age range of 2-4, 4-6, 6-8, 8-10, and 10-12 years, respectively, 12, 16, 16, 12, 4, and 60 subjects had eosinophilic infiltration >20/HPF (Table 3). The eosinophilic index and growing age showed an inverse relationship (p=0.04).

Also, a positive relation was seen in the eosinophilic index and polyp size with p=0.02. These findings were consistent with those of Zheng E et al. (2012) and Attard TM et al. (2013), who also found an inverse relationship between age and juvenile polyps.

CONCLUSIONS

Solitary juvenile polyps account for the majority of gastrointestinal polyps observed in children. Significant eosinophilic infiltration of gastrointestinal polyps may indicate that allergies may play a part in the etiopathogenesis of juvenile polyps. Nevertheless, the study's drawback was that it only included a small number of participants and was carried out at a single location in the same area. The presence of gastrointestinal polyps in children can be complicated and impacted by local and environmental factors. Therefore, future multi-center research involving participants from different geographic backgrounds may aid in delving deeper into the problem.

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Polyps type	Inflammatory polyps	Peutz- Jeghers polyp	Juvenile polyposis coli	Solitary juvenile polyps
Eosinophilic infiltration <20/HPF	6	6	4	8
Eosinophilic infiltration >20/HPF	0	0	0	60

Table 1: Classification of polyps based on the histology

Polyps type	Total	<1cm	1-2 cm	>2cm
Eosinophilic infiltration <20/HPF	12	0	2	10
Eosinophilic infiltration >20/HPF	60	8	38	14
Total	72	8	40	24

Table 2: correlation of juvenile polyp size to eosinophilic infiltration

Age groups	2-4	4-6	6-8	8-10	10-12	Total
Eosinophilic infiltration <20/HPF	0	0	2	4	6	12
Eosinophilic infiltration >20/HPF	12	16	16	12	4	60
Total	12	16	18	16	10	72

Table 3: Correlation to eosinophilic infiltration with age in study subjects