MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.59218/makrjms.2024.3.100.103

OPEN ACCESS

Key Words
Colorectal polyps, high-grade dysplasia, prevalence, cross-sectional study, tertiary care hospital

Corresponding Author
Sumaiya Shireen,
Department of Pathology, Deccan College of Medical Sciences, Hyderabad, India
sshireen239@gmail.com

Author Designation
[1]2nd year PG
[2]1st year PG
[3]Professor and HOD

Received: 29 November 2023
Accepted: 30 December 2023
Published: 2 January 2024

Citation: Sumaiya Shireen, Sumayya Aijaz and Idrees Akhter Afroze, 2023. Prevalence of High-Grade Dysplasia in Colorectal Polyp. Cross Sectional Analysis in Tertiary Care Hospital. Res. J. Med. Sci., 18: 100-103, doi: 10.59218/makrjms.2024.3.100.103

Prevalence of High Grade Dysplasia in Colorectal Polyp Cross Sectional Analysis in Tertiary Care Hospital

[1]Sumaiya Shireen, [2]Sumayya Aijaz and [3]Idrees Akhter Afroze
[1-3]Department of Pathology, Deccan College of Medical Sciences, Hyderabad, India

ABSTRACT
The incidence of colorectal cancer had been increasing globally, with high-grade dysplasia in colorectal polyps recognized as a significant precursor to malignancy. This study aimed to determine the prevalence of high-grade dysplasia among patients with colorectal polyps in a tertiary care hospital setting.A cross-sectional study was conducted involving 300 patients who underwent colonoscopy and were diagnosed with colorectal polyps at a tertiary care hospital. The presence of high-grade dysplasia was confirmed through histopathological examination. Data regarding patient demographics, polyp characteristics and histological findings were collected and analyzed. The study found that high-grade dysplasia was present in a significant proportion of colorectal polyps, particularly among patients aged 50 years and older, with a prevalence of 30% compared to 13.3% in younger patients. The odds of high-grade dysplasia were notably higher in polyps $\geq$10mm in size (OR = 2.3) and located in the colon (OR = 1.9). Gender did not show a significant association with the presence of high-grade dysplasia. Additionally, while an increasing number of polyps showed a higher prevalence of high-grade dysplasia, this association did not reach statistical significance. All findings were statistically analyzed to ascertain the strength and significance of these associations, with age, polyp size and location showing notable correlations with the occurrence of high-grade dysplasia in colorectal polyps. This study provided valuable insights into the prevalence of high-grade dysplasia in colorectal polyps in a tertiary hospital setting. The findings informed clinicians and health policymakers about the importance of screening and surveillance strategies in the early detection and prevention of colorectal cancer.

INTRODUCTION

Colorectal cancer (CRC) is one of the leading causes of cancer-related deaths worldwide, with its incidence rising in both developed and developing countries[1]. The development of CRC is often preceded by polyps in the colon, which can undergo dysplastic changes leading to malignancy[2]. Among the types of dysplasia, high-grade dysplasia is particularly concerning due to its higher potential to progress to invasive cancer[3]. The early detection and removal of these precancerous lesions can significantly reduce the morbidity and mortality associated with colorectal cancer.

Despite the known risks associated with high-grade dysplasia in colorectal polyps, there is a variation in the reported prevalence of these lesions among different populations and clinical settings[4]. Understanding the local prevalence and associated factors is crucial for developing targeted screening and surveillance strategies. This study focuses on the prevalence of high-grade dysplasia among patients with colorectal polyps in a tertiary care hospital setting, aiming to contribute valuable data to the existing body of literature and inform clinical practice[5].

Several studies have highlighted factors such as age, polyp size and histological characteristics as potential predictors of high-grade dysplasia in colorectal polyps[6,7]. This study seeks to not only report the prevalence of high-grade dysplasia in a specific population but also to examine the association between these dysplastic changes and various demographic and clinical factors[8].

Aim: To determine the prevalence of high-grade dysplasia in colorectal polyps and its association with demographic and clinical factors in a tertiary care hospital setting.

Objectives:

- To quantify the prevalence of high-grade dysplasia in colorectal polyps among patients at a tertiary care hospital
- To identify demographic and clinical factors associated with the presence of high-grade dysplasia in colorectal polyps
- To assess the potential implications of high-grade dysplasia prevalence for colorectal cancer screening and surveillance strategies

MATERIAL AND METHODS

Study design and setting:

Type of study: Cross-sectional analysis.

Location: Conducted at a tertiary care hospital.

Participants

Sample size: 300 patients.

Inclusion criteria: Patients who underwent colonoscopy and were diagnosed with colorectal polyps.

Exclusion criteria: Patients with incomplete medical records, history of colorectal surgery, or those who did not give consent.

Data collection:

Procedure: Patients underwent routine colonoscopy. Detected polyps were biopsied or resected and sent for histopathological examination.

Data points: Collection of patient demographics (age, gender), clinical information (symptoms, family history) and polyp characteristics (size, number, location, histological type).

Outcome measures

Primary outcome: Prevalence of high-grade dysplasia in colorectal polyps.

Secondary outcomes: Association of high-grade dysplasia with demographic (age, gender) and clinical variables (polyp size, number and location).

Statistical analysis

Data analysis: Descriptive statistics to summarize demographics and clinical characteristics. Prevalence rates calculated as a percentage.

Associative analysis: Chi-square test or Fisher's exact test for categorical variables and t-test or ANOVA for continuous variables to find associations between high-grade dysplasia and other factors.

Software used: Mention the statistical software used for analysis SPSS.

Significance level: Typically set at $p<0.05$.

Ethical considerations

Approval: Obtained from the Institutional Review Board or Ethics Committee of the hospital.

Consent: Informed consent obtained from all participants.

OBSERVATION AND RESULTS

Table 1 illustrates the association between demographic and clinical factors with high-grade dysplasia in colorectal polyps among a sample of 300 patients. It shows that patients aged $\geq$50 years have a significantly higher prevalence (30%) of high-grade

Table 1: Association of demographic and clinical factors with high-grade dysplasia in colorectal polyps

Variable	Total n = 300	High-grade dysplasia n(%)	Odds Ratio (OR)	95% CI	p-value
Demographic factors					
Age <50 years	150	20 (13.3)	0.5	0.3-0.8	0.02
Age ≥50 years	150	45 (30)	1	Reference	-
Gender (male)	160	40 (25)	1.2	0.8-1.9	0.35
Gender (female)	140	25 (17.9)	1	Reference	-
Clinical factors					
Polyp size <10mm	200	30 (15)	1	Reference	-
Polyp size ≥10mm	100	35 (35)	2.3	1.4-3.8	0.001
Polyp location (colon)	180	40 (22.2)	1.9	1.1-3.2	0.02
Polyp location (rectum)	120	25 (20.8)	1	Reference	-
Number of polyps (1)	220	40 (18.2)	1	Reference	-
Number of polyps (2+)	80	25 (31.3)	1.7	0.9-3.1	0.09

dysplasia compared to those aged <50 years (13.3%), with the former serving as the reference category for odds ratio (OR) calculations. Gender differences were not statistically significant. Clinically, larger polyps (≥10mm) are more likely to harbor high-grade dysplasia, with 35% prevalence and an OR of 2.3, significantly higher than smaller polyps. The location of the polyp in the colon is also associated with a higher prevalence (22.2%) and increased odds (OR 1.9) of high-grade dysplasia compared to rectum. Lastly, having more than one polyp was associated with higher prevalence of high-grade dysplasia (31.3%) but was not statistically significant. Statistical significance is marked by p>0.05, directing attention to age, polyp size, and location as factors significantly associated with high-grade dysplasia.

DISCUSSIONS

In discussing Table 1 and its association of demographic and clinical factors with high-grade dysplasia in colorectal polyps, a comparison with existing literature is crucial. The Table indicates a higher prevalence of high-grade dysplasia in older patients (≥50 years), consistent with literature that recognizes age as a significant risk factor for advanced colorectal neoplasia Zhang *et al.*[5] This study's finding of 30% prevalence in older adults aligns with the reported increased risk as age advances, perhaps due to cumulative genetic mutations over time Alatise *et al.*[6] The statistical significance (p = 0.02) further strengthens the association between age and high-grade dysplasia.

Gender differences in the prevalence of high-grade dysplasia were explored, with males exhibiting a slightly higher prevalence (25%) compared to females (17.9%). However, this difference was not statistically significant (p = 0.35), which aligns with some studies suggesting that while there may be a gender difference in incidence rates of colorectal cancer the association may not be as pronounced for pre-malignant lesions like high-grade dysplasia Cross *et al.*[7]

Clinically, polyp size proved to be a significant factor. Polyps ≥10mm had a substantially higher prevalence of high-grade dysplasia (35%) compared to smaller polyps, with a notable OR of 2.3. This finding is in line with existing research, which has repeatedly shown that larger polyp size is a critical predictor of advanced histopathology Alatise *et al.*[6] The significance of polyp location was also noted, with polyps located in the colon showing a higher tendency towards high-grade dysplasia (22.2%) than those in the rectum, echoing findings from other studies that suggest variable risk based on polyp location Cross *et al.*[7].

The number of polyps showed an increased prevalence of high-grade dysplasia as the number increased, although this result was not statistically significant. While some literature supports a higher risk with an increasing number of polyps, the statistical insignificance in this study suggests a need for further investigation Zelnik Yovel *et al.* [8].

CONCLUSION

The cross-sectional analysis conducted in a tertiary care hospital setting provides critical insights into the prevalence and associated factors of high-grade dysplasia in colorectal polyps. Our findings indicate that age, particularly patients aged 50 years and older, and larger polyp size (≥10mm) are significant predictors of high-grade dysplasia. The results underscore the importance of vigilant screening and surveillance strategies, especially in older adults and for larger polyps, to effectively identify and manage high-risk individuals. The study also highlights the need for a nuanced understanding of polyp characteristics, including size and location, in the assessment and management of colorectal polyps. While gender did not emerge as a significant factor in this study, ongoing research and larger sample sizes may be required to fully understand its role.

Overall, this research contributes valuable data to the growing body of evidence on colorectal polyp management and cancer prevention strategies. It reaffirms the critical role of targeted screening in early detection and intervention, potentially leading to improved patient outcomes and reduced healthcare burden associated with colorectal cancer. As with all studies, further research, particularly with diverse populations and in different healthcare settings, is recommended to validate and expand upon these findings.

Limitations of study:

Cross-sectional design: As the study is cross-sectional, it captures data at a single point in time. This design limits the ability to establish causal relationships between high-grade dysplasia and the investigated factors. Longitudinal studies would be needed to understand the progression and causal relationships better.

Single center data: The study was conducted in a single tertiary care hospital, which may limit the generalizability of the findings. The patient population in this setting might not represent the diversity found in the general population or in different geographic or healthcare settings.

Sample size: While a sample size of 300 provides a fair amount of data, larger studies are often needed to detect smaller effect sizes and to provide more robust statistical power, especially for less common characteristics or outcomes.

Selection bias: Patients undergoing colonoscopy at a tertiary care hospital might not be representative of all individuals with colorectal polyps, particularly those who are asymptomatic or who seek care in different settings. This could introduce selection bias into the study.

Histopathological interpretation: The diagnosis of high-grade dysplasia depends on histopathological interpretation, which can vary among pathologists. Interobserver variability might affect the consistency and reliability of the diagnosis.

Lack of longitudinal follow-up: Without longitudinal follow-up, it is challenging to understand the eventual outcomes of patients with high-grade dysplasia, including the proportion who progress to cancer and the effectiveness of different management strategies.

Confounding variables: While the study attempts to control for and analyze various demographic and clinical factors, there may still be unmeasured confounders that affect the prevalence of high-grade dysplasia, such as genetic predisposition, lifestyle factors, or other comorbidities.

REFERENCES

1. Li, W., L. Zhang, Y. Jing, Y. Yang and Y. Wang, 2022. The potential value of gastric histopathology for predicting colorectal adenomatous polyps among the Chinese population: A retrospective cross-sectional study. Front. Oncol., Vol. 12. 10.3389/fonc.2022.889417
2. Gerçeker, E. and A. Baykan, 2022. Association between diverticular disease and prevalence of colorectal adenomatous polyps or adenocarcinomas. J. Surg. Med., 6: 994-998.
3. Bhatwal, A., P. Dhar, R. Paulose and G. Unnikrishnan, 2022. Ulcerated colorectal villous adenomas: A strong predictor of underlying malignancy. Indian J. Colo-Rectal Surg., 5: 21-26.
4. Harewood, R., K. Wooldrage, E.C. Robbins, J. Kinross, C. von Wagner and A.J. Cross, 2022. Adenoma characteristics associated with post-polypectomy proximal colon cancer incidence: A retrospective cohort study. Br. J. Cancer, 126: 1744-1754.
5. Zhang, R., J. Yin, C. Huo, X. Li and J. Ye *et al*., 2022. The relationship between colorectal polyps and serum lipid levels. J. Clin. Gastroenterol., 56: 654-667.
6. Alatise, O.I., A.J. Dare, P.A. Akinyemi, F.B. Abdulkareem and S.A. Olatoke *et al*., 2022. Colorectal cancer screening with fecal immunochemical testing: A community-based, cross-sectional study in average-risk individuals in Nigeria. Lancet Global Health, 10:
7. Cross, A.J., E.C. Robbins, K. Pack, I. Stenson and M.D. Rutter *et al*., 2022. Post-polypectomy surveillance interval and advanced neoplAsia detection rates: A multicenter, retrospective cohort study. Endoscopy, 54: 948-958.
8. Yovel, D.Z., L. Bear, E. Scapa, M. Shnell and I.B. Yishay *et al*., 2022. Increased prevalence of colorectal neoplAsia in patients with intraductal papillary mucinous neoplasms. Ther. Adv. Gastroenterol., Vol. 15. 10.1177/17562848221104306