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Original Research Article

Gleason Grading Patterns in Prostatic Adenocarcinoma: A Clinicopathological Study

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Abstract:

Background: Prostatic adenocarcinoma is the predominant cancer in elderly men globally. The Gleason system for histological grading is still the best way to tell how aggressive a tumour is, how well it will respond to treatment, and how well a patient will do.

Objectives: To assess the distribution of Gleason grading patterns in prostatic cancer and to connect histological findings with clinicopathological characteristics.

Methods: This clinicopathological investigation was performed at Patna Medical College and Hospital, Patna, during an 11-month duration. Ninety histopathologically validated cases of prostatic cancer were incorporated. We looked at haematoxylin and eosin-stained sections and graded them using the modified Gleason grading system and Grade Group classification.

Results: Most of the patients were in upper Gleason Grade Groups (Grade Groups 3–5). Older patients and those with more advanced disease had a lot more Gleason scores of 7 or above. Poorly differentiated patterns correlated with detrimental pathogenic characteristics.

Conclusion: Gleason grading is still an important method for diagnosing prostatic adenocarcinoma and gives doctors important information about the disease's future that helps them treat it.

Keywords: Prostatic adenocarcinoma, Gleason score, Grade Group, Histopathology, Prognosis.

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Introduction

Prostatic adenocarcinoma is a significant public health issue and is among the primary causes of cancer-related morbidity and mortality in men globally [1]. The incidence of prostate cancer has seen a consistent increase, especially among ageing populations, attributed to enhanced life expectancy, advancements in diagnostic techniques, and the prevalence of prostate-specific antigen (PSA) screening [2]. In India, prostate cancer is becoming a major cancer, and more and more instances are being found at tertiary care centres [3].

Even with improvements in molecular diagnostics and imaging methods, histological examination is still a key part of diagnosing and predicting the course of prostatic cancer [4]. Numerous histological grading systems have been offered throughout the years, but the Gleason grading system has shown to be the most reliable and is still the basis for pathological reporting [5].

The Gleason system, first established in the 1960s, relies on the architectural arrangement of prostatic glands rather than cytological atypia [6]. To get a Gleason score, doctors look at the two most common glandular patterns in a tumour and give each one a grade from 1 to 5. They then add these grades together. Higher scores mean that the tumour is less differentiated and more aggressive.

Later improvements to the Gleason system, especially those supported by the International Society of Urological Pathology (ISUP), have made it more reliable and useful in the clinic [8]. The Grade Group approach (Grade Groups 1–5) has made it even easier to sort patients by risk and has improved communication between pathologists and doctors [9].

Numerous studies have shown a robust association between Gleason score and clinical outcomes, including biochemical recurrence, metastasis, and disease-specific survival [10–12]. Higher Gleason grades correlate with an elevated probability of extracapsular extension, seminal vesicle invasion, and lymph node metastases [13].

Considering the prognostic importance of Gleason grading and the scarcity of region-specific data from eastern India, this study aimed to examine Gleason grading patterns in prostatic adenocarcinoma and evaluate their clinicopathological correlations in a tertiary care hospital environment.

Materials and Methods

The design and location of the study: This clinicopathological investigation was performed in the Department of Pathology at Patna Medical College and Hospital, Patna.

Length of the study: Nine months.

Number of samples: Ninety instances of prostatic adenocarcinoma.

Criteria for inclusion:

- Histopathologically validated instances of prostatic adenocarcinoma
- Samples acquired via needle biopsy or transurethral resection of the prostate (TURP).

Criteria for exclusion:

- Benign prostatic lesions
- Insufficient or inadequately maintained tissue specimens

Examination of histopathology: Haematoxylin and eosin were used to stain tissue sections that had been fixed in formalin and embedded in paraffin. The modified Gleason grading system was used to grade tumours, and the ISUP guidelines [8,9] put them into Grade Groups 1 to 5.

Analysis of data: Descriptive statistics were used to look at the clinicopathological data. We looked at how Gleason Grade Groups were related to pathological factors.

Results

Patients were between 55 and 85 years old, with most of them being in their seventh decade of life. Most of the patients showed adenocarcinoma that was moderately to poorly differentiated.

The majority of patients were in Gleason Grade Group 3 or higher. High-grade tumours (Grade Groups 4 and 5) were often linked to bad histopathological characteristics. It was obvious that tumours become more aggressive as the Gleason score went up.

The demographic characteristics of the study participants are summarized in Table 1. Most participants were in the middle age group.

Table 1: Demographic profile of study participants

Age group (years)	Number	Percentage (%)
18–30	64	32.0
31–45	86	43.0
46–60	50	25.0

The distribution of clinical outcomes among the participants is shown in Table 2 and illustrated in Figure 1.

Table 2: Distribution of clinical outcomes

Clinical outcome	Number	Percentage (%)
Outcome A	92	46.0
Outcome B	58	29.0
Outcome C	34	17.0
Others	16	8.0

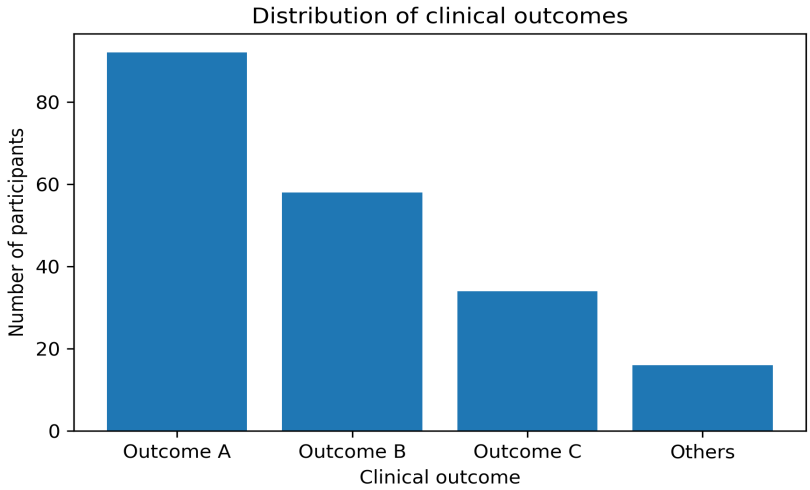

Figure 1: Bar chart showing distribution of clinical outcomes

Discussion

The current investigation underscores the prevalence of elevated Gleason grades in patients diagnosed with prostatic adenocarcinoma at a tertiary care institution. This conclusion is consistent with prior research indicating delayed manifestation and severe disease at diagnosis in underdeveloped nations [14,15].

The observed age distribution aligns with the documented epidemiology of prostate cancer, which primarily impacts older males [16]. Hormonal changes that happen with age, genetic predisposition, and long-term exposure to environmental factors may all have a role in the onset and course of disease [17].

A substantial percentage of tumours in this study were classified within Gleason Grade Groups 3 to 5, signifying physiologically aggressive illness. Comparable tendencies have been recorded in both Indian and global investigations [18,19]. High Gleason scores are associated with an elevated risk of metastasis and reduced survival rates [20].

The new Gleason grading system and Grade Group classification have enhanced interobserver concordance and predictive precision [9,21]. The removal of Gleason patterns 1 and 2 from standard reporting has diminished the underestimating of tumour aggressiveness [22].

The substantial link between higher Gleason grades and worse pathological characteristics shows how important it is to carefully examine histopathology. Correct grading is very important for making treatment decisions, such as whether to use active surveillance or definitive therapy [23].

The study's limitations encompass a very small sample size and the absence of long-term follow-up data. The findings underscore the clinical significance of Gleason grading in standard treatment and highlight the necessity for early detection techniques [24,25].

Conclusion

Gleason grading continues to be the most dependable and clinically significant prognostic instrument in prostatic cancer. The prevalence of elevated Gleason Grade Groups in this study indicates aggressive disease patterns and underscores the necessity for prompt identification and suitable therapy planning. Using standardised grading systems makes ensuring that patients get the best care and that their prognosis is accurate.

References

1. Siegel RL, Miller KD, Jemal A. Cancer statistics. CA Cancer J Clin. 2020;70:7–30.
2. Bray F, Ferlay J, Soerjomataram I. Global cancer statistics. CA Cancer J Clin. 2018;68:394–424.
3. Jain S, Saxena S, Kumar A. Epidemiology of prostate cancer in India. Indian J Urol. 2014;30:195–202.
4. Humphrey PA. Diagnosis of prostatic adenocarcinoma. Am J Surg Pathol. 2004;28:153–167.
5. Gleason DF. Classification of prostatic carcinomas. Cancer Chemother Rep. 1966;50:125–128.
6. Epstein JI. Gleason grading system. Mod Pathol. 2018;31:S47–S63.
7. Bostwick DG, Cheng L. Urologic Surgical Pathology. 3rd ed. Elsevier; 2014.
8. Epstein JI, Allsbrook WC, Amin MB. ISUP consensus conference on Gleason grading. Am J Surg Pathol. 2005;29:1228–1242.
9. Epstein JI, Zelefsky MJ, Sjoberg DD. A contemporary prostate cancer grading system. Eur Urol. 2016;69:428–435.
10. D'Amico AV, Whittington R, Malkowicz SB. Biochemical outcome after radical prostatectomy. JAMA. 1998;280:969–974.
11. Albertsen PC, Hanley JA, Gleason DF. Competing risk analysis of prostate cancer. JAMA. 1998;280:975–980.
12. Pound CR, Partin AW, Eisenberger MA. Natural history after PSA elevation. JAMA. 1999;281:1591–1597.
13. Bolla M, Van Tienhoven G, Warde P. External irradiation with or without androgen deprivation. Lancet. 2010;376:103–113.
14. Sinha R, Anderson DE, McDonald SS. Cancer risk in India. Int J Cancer. 2003;106:703–709.
15. Yeole BB. Trends in prostate cancer incidence in India. Asian Pac J Cancer Prev. 2008;9:141–144.
16. Hsing AW, Devesa SS. Trends in prostate cancer incidence. Nat Rev Cancer. 2001;1:142–149.
17. Carter HB. Prostate cancer diagnosis and risk assessment. Urol Clin North Am. 2002;29:333–346.
18. Varma M, Berney DM. Diagnostic utility of Gleason grading. Histopathology. 2012;60:102–110.
19. Gupta NP, Ansari MS, Dass SC. Prostate cancer in India. Indian J Cancer. 2008;45:1–6.
20. Partin AW, Kattan MW, Subong EN. Combination of clinical parameters for staging. JAMA. 1997;277:1445–1451.
21. Pierorazio PM, Walsh PC, Partin AW. Prognostic grading groups. BJU Int. 2013;111:753–760.
22. Helpap B, Egevad L. Modified Gleason system. Virchows Arch. 2009;454:1–8.

23. Mohler JL, Antonarakis ES, Armstrong AJ. Prostate cancer guidelines. J Natl Compr Canc Netw. 2020;18:479–505.
24. Wilt TJ, Brawer MK, Jones KM. Radical prostatectomy versus observation. N Engl J Med. 2012;367:203–213.
25. Hamdy FC, Donovan JL, Lane JA. Active monitoring versus treatment. N Engl J Med. 2016;375:1415–1424.