

ORIGINAL RESEARCH

Role of Neutrophil lymphocyte ratio as a prognostic marker in bladder cancer: an institutional study

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ABSTRACT

Background& Objectives:Bladder cancer is one of the commonest cancers encountered worldwide. There is dearth of significant prognostic marker of it. Neutrophil lymphocyte ratio may be a significant prognostic marker of bladder cancer as recent studies have linked it to several malignancies. The present study was intended to evaluate its usefulness in bladder cancer. **Methods:**A total of 32 patients with bladder cancer were evaluated for Neutrophil to lymphocyte ratio preoperatively from 2016 to 2018 at AIIMS Patna. Patients were followed with postoperative histopathology reports. Trans-urethral resection of bladder tumour was done initially in all the patients. Pathological grade was correlated to the initial Neutrophil lymphocyte ratio. **Result:**Higher Neutrophil lymphocyte ratio significantly correlated to higher grade of tumour. **Conclusion:**Preoperative Neutrophil lymphocyte ratio predicts the aggressiveness of bladder cancer.

Key words:Neutrophil lymphocyte ratio, bladder cancer, TURBT, Grade of Tumour.

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INTRODUCTION

Bladder cancer is one of the most common cancer encountered worldwide.¹It is the most common malignancy of the urinary tract.²Urothelial carcinoma is the most common type of bladder cancer, constituting up to 95% of bladder malignancies.³ Most of the patients with bladder cancer present with non-muscle invasive disease (NMIBC), which includes the Tis, Ta and T1 pathologic stages.⁴ In general, these cancers are primarily managed by endoscopic resection, transurethral resection of bladder tumour (TURBT)⁽⁵⁻⁷⁾ The main concern during treatment of NMIBC is progression to a muscle invasive stage (T2), which dramatically worsens prognosis.⁸ Several novel prognostic markers have been described which are often cumbersome and not readily available. Over the years, there have been interesting reports on prognostic value of Neutrophil- lymphocyte ratio (NLR) at the time of diagnosis. High NLR was reported to be associated with advanced stage, increased mortality, and decreased overall survival in patients with muscle-invasive disease⁽⁹⁻¹¹⁾, along with higher risk of recurrence and progression in non-muscle invasive disease⁽¹²⁻¹³⁾.

Aim and objectives

To study the correlation between preoperative NLR and grade of the tumour and pathological stage in patients with primary NMIBC.

MATERIALS AND METHODS

Study Duration:from August 2016 to October 2018.

Study setting:Department of General Surgery & Oncology, All India Institute of Medical sciences, Patna Bihar, India.

Study design: institution based descriptive study.

Study technique:A total of 36 patients were enrolled in this study during the aforesaid period. Written consent was taken from all the participants. Patients were preoperatively evaluated with history taking, physical examination, routine blood investigations, routine urine examinations and ultrasonography of abdomen and pelvis. Neutrophil to lymphocyte ratio was calculated from complete blood counts preoperatively. Patients having fever or recent history of fever within a week time were excluded. All patients were operated within 72 hours of investigations if fit for surgery. In all patients TURBT

was the primary modality of surgical care. Postoperative histopathology reports were checked.

Statistical analysis: The patients’ characteristics, preoperative factors and postoperative histopathology reports were analyzed by Mann–Whitney U and chi-square tests. Multivariate logistic regression models were used for studying the individual factors.

RESULT

Out of the 36 patients studied, 32 were male while 4 patients were female. 35 patients were having history of at least 2-3 episodes of painless haematuria while in one patient it was an incidental detection for some other pathology. No patients were having haematuria at the time of preoperative evaluation leading to operation (TURBT). All patients were having tumour size less than 2cm in size on ultrasonography. Muscle was present in the entire samples but not involved in histopathology reports. ReTURBT was done within 4

weeks of 1st TURBT in all cases of pathological T1 and high-grade Ta (total 28 cases). Muscle was present but not involved in all the 28 samples in histopathology reports of reTURBT. Out of 36 histopathology reports 8 cases were having Ta low grade, 8 were having Ta high grade, 12 were having T1 low grade and rest 8 cases were having T1 high grade urothelial carcinoma. Preoperative NLR more than 2.5 was found in 15 patients. Out of 15 patients 12 patients were having high grade urothelial carcinoma (4 had Ta high grade and 8 had T1 high grade urothelial carcinoma) and rest 3 patients were having T1 low grade cancer. 11 patients out of 15 patients with NLR more than 2.5 were T1 stage while 4 were having Ta stage. Table 1 depicts the general characteristics of the study population.

Table 1: characteristics of the participants

Parameters	value	value
SEX	Male: 32	Female: 4
GRADE OF TUMOUR	LOW GRADE; 20	HIGH GRADE; 16
	Ta: 8	Ta: 8
	T1: 12	T1: 8
STAGE OF TUMOUR	Ta: 16	T1: 20
NLR>2.5 (n=15)	Ta: 4 high grade + 0 low grade	T1: 8 high grade plus 3 low grade
	Low grade: 3 T1 + 0 Ta	High grade: 4ta + 8 T1

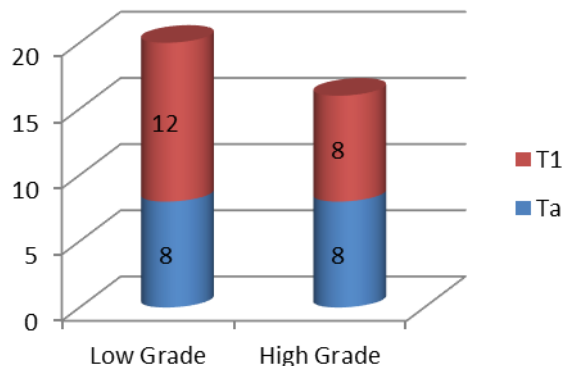


Fig 1: Grade of the tumours

Low grade 20(55.55%), high grade 16 (44.45%)

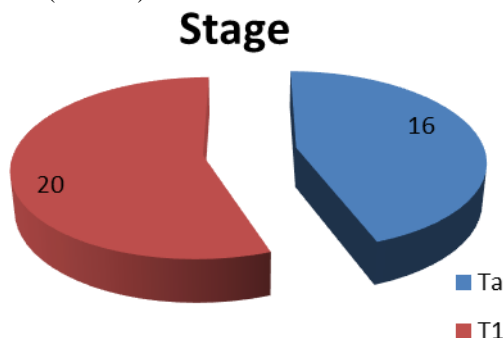


Fig 2: Stage of the disease

Ta stage 16(44.44%), T1 stage 20(55.55%)

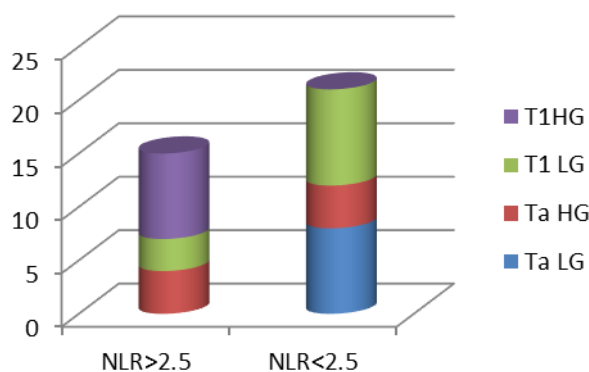


Fig 3: NLR >2.5 in different stage of disease

4Ta(all high grade), 11T1(8 high grade, 3 low grade)

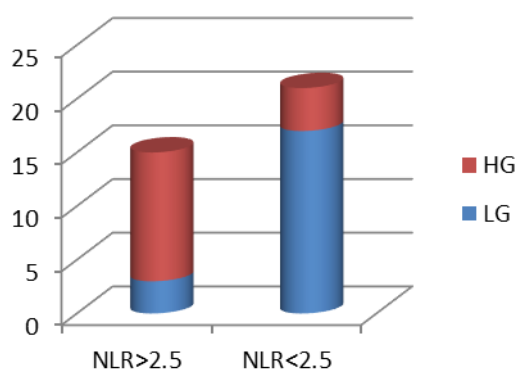


Fig 4: NLR >2.5 in different grade of tumour

3 low grade (all T1), 12 high grade (8T1, 4ta)

DISCUSSION

Inflammation plays pivotal role in tumour progression. Neutrophils may have a pro-tumoural phenotype that promotes angiogenesis, invasion, metastasis, and immunosuppression¹⁴. Our study showed that high NLR (>2.5) was associated with high grade of tumour. Similar study by Damian Sudol et al has shown an elevated NLR is associated with adverse histopathological findings.¹⁵ Our study also showed that high NLR (>2.5) was associated with higher stage of tumour in NMIBC. Similar study byltamar Getzler et al has also shown an elevated NLR is associated with higher stage of bladder cancer.¹⁶

CONCLUSION

NLR more than 2.5 is significant predictor of grade of the tumour in patients of NMIBC. Higher NLR is also associated with higher stage of the tumour in patients of NMIBC.

Limitations

NLR may change as only one reading was taken preoperatively. Possibility of chronic medications altering NLR may not be ruled out. Small sample size and preoperative and postoperative reporting by different individuals may be a limiting factor.

Random selection of 2.5 as high NLR may be a limiting factor.

Conflict of interest: None to declare.

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