

Efficacy of Mitomycin C and BCG in Urinary Bladder Tumor

Mitomycin C and
BCG in Urinary
Bladder Tumor

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ABSTRACT

Objective: To compare the treatments of urinary bladder cancer by Mitomycin C and BCG in order to find out the better drug with good outcomes and least complications.

Study Design: Comparative study.

Place and Duration of Study: This study was conducted at the NORIN Hospital Nawabshah and Urology Department PMC Hospital Nawabshah from July 2016 to June 2018.

Materials and Methods: This is a two years study of total 40 patients included 25 (62.5%) males and 15 (37.5%) females suffering from urinary bladder tumor. All the patients were admitted from Urology OPD and emergency investigated and treated accordingly.

Results: Total 40 were included, only 15 (37.5%) were females and 25 (62.5%) were males. Dysuria was common after use of MMC as compared to BCG. Fever was common after use of BCG. Cystitis was little more after use of BCG as compared to MMC. Recurrence was least in case of BCG as compared to MMC use.

Conclusion: It is concluded from our study that BCG is the better drug as compared to MMC because the former has least complications particularly recurrence as compared to MMC use.

Key Words: bladder cancer, BCG, MMC, Cystitis, Dysuria

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INTRODUCTION

Urinary bladder cancer is counted as the 9th most commonly occurring throughout world. It is 5th most common in Europe and 4th in United States Of America (U.S.A). Its incidence is increasing in the globe. Most of the patients initially present with superficial disease (non muscle invasive). Non invasive muscle bladder cancers/carcinoma in situ is a heterogeneous group of tumors with different outcomes. In early stage, the disease is confined tiurothelium (Ta) or lamina propria (T1).¹ Bladder cancer is commonly prevalent among men as compared to females having ratio of 4:3 respectively.²

These tumors are usually managed initially by cystoscopic observation followed by transurethral resection (TUR). Biopsy is done.

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If resectable, the entire tumor is resected. Despite complete surgical resection, two thirds recur. High risk patients are treated with adjuvant intravesical therapy aiming at preventing it from recurrence. This is called intravesical therapy. The most commonly drugs used for this purpose are Mitomycin C (MMC) and Bacillus Calmette Guerin (BCG). There is a high recurrence rate in non-muscle invasive cancer after resection and can progress to muscle invasive cancer with poor prognosis.^{3,4}

Centanni and Rezzesi were the first who unveiled the use of Bacillus Calmette Guerin (BCG) against cancer in mice in 1926 A.D. later on other experiments were also conducted in this regard by using this therapy against melanoma, leukemia, colon cancer and lung cancer getting good results of remission in 1960 A.D. In 1976 A.D, the first person used BCG against bladder cancer was Morales and collaborators.⁵

Various intravesicalcytotxic agents are given in superficial bladder cancer. These include mitomycin C, adriamycin, bleomycin, epirubicin, thiotepa and cytosine-arabinoside. The antitumor antibiotic MMC is commonly used for treating superficial bladder cancer and recurrence rate is 7-81%. MMC has been considered to be better than adriamycin and thiotepa but equivalent to epirubicin. The adverse effects of MMC are chemical cystitis and contact dermatitis.^{6,7}

Other intravesicaltherapy commonly used includes nonspecific immunotherapy with BCG. This has been

used as treatment of superficial bladder tumors since 1976 A.D.⁸

Recent advances suggest that the tumors having risk of recurrence must be treated with adjuvant intravesical immunotherapy with BCG or adjuvant intravesical chemotherapy with MMC, epirubicin or doxorubicin.^{9,10} This therapy has effect on initial cancer recurrence but not on the progression of the disease. BCG is considered to be superior to intravesical chemotherapy with regard to recurrence of the disease. But BCG is more toxic as compared to MMC. Some studies have called superiority of BCG as unclear against MMC.^{11,12} The rationale of our study is to find out the outcomes of comparison of MMC and BCG as intravesical therapy in patients suffering from Urinary Bladder tumors so that patients may get benefit from the better therapy and prevent from recurrence.

MATERIALS AND METHODS

A comparative study of 40 patients was conducted at NORIN Nawabshah and Urology Department of Peoples Medical College Hospital from July 2016 to June 2018. All patients were admitted through Urology Out Patient Department (OPD) and emergency. History and clinical examination were done. The provisional diagnosis was made and patient was advised to get Ultrasound and plain X-Ray abdomen apart from CT scan abdomen and pelvis to reach the diagnosis. Diagnosis was made and prepared for cystoscopic biopsy and required surgery. After getting the histopathological report, intravesical chemotherapy as well as immunotherapy (MMC & BCG) was started respectively at NORIN Nawabshah as well as PMCH Urology Department.

Patients included in this study were aged from 18 years to 80 years. Diagnosed cases of pathologically confirmed non-muscle invasive bladder tumors from Private Hospital and Other Urological institutions were also included. Patients operated for biopsy and tumor resection later on diagnosed as carcinomas were also part of our study. Only Ta or T1 non muscle invasive tumors were included. The patients with advanced bladder tumor were excluded from the study.

RESULTS

This is a comparative study of 2 years from July 2016 to June 2018. Total 40 patients were admitted and study was conducted at NORIN Nawabshah and Urological Department of Peoples Medical College Hospital.

Of 40, only 15 (37.5%) were females and 25 (62.5%) were male. Two drugs were given to patients according to the stage of disease. MMC were given to patients of T1, G1 and also G2. It was given state in a dose of 40mg diluted in 20 ml Normal saline after 6 hours of

Surgery. Whereas 1 vial of BCG diluted in 50 ml normal saline was given state to patients 14 hours after surgical interventions. Agent was retained in bladder for 2 hours and then retained. It was not used in patients suffering from bleeding disorder, urethral stricture, urinary tract infections and pregnancy.

The use of both drugs showed various side effects. Only 6% and 2% patients showed hematuria by use of MMC and BCG respectively. Dysuria was common after use of MMC as compared to BCG. 17% was in case of MMC and only 7% was of BCG use. 9% patients presented with fever after use of BCG and 2% in case of MMC. Patients of BCG use developed Cystitis in 41% and 30% after MMC use. Recurrence was least in case of BCG as compared to MMC. Only 2% showed recurrence after use of BCG. This is shown in Table below.

Table No.1: Side Effects

S.No	Side Effects	MMC Use	BCG Use
1	Hematuria	6%	2%
2	Dysuria	17%	7%
3	Fever	2%	9%
4	Cystitis	30%	41%
5	Recurrence	10%	2%

DISCUSSION

Currently, urinary bladder cancer is counted as the most common malignancy of the Urinary tract. It is the 6th common in men and the 19% in women.¹³ Most of the patients are usually diagnosed at the age of 63 years. Recurrence rate is at 80%. Tumor recurrence after TUR is the major problem for the patient as well as Surgeon. Intravesical treatment with either BCG or MMC is effective for the bladder tumors of Ta and T1.¹⁴

The studies have shown that prolonged treatment of BCG is effective as compared to short scheduled MMC. Same is shown in our study. Some studies have shown that the side effects of BCG are intensive to MMC.¹⁵ Our study also shows more complications after use of BCG as compared to MMC but the big advantage of BCG use in our study is shown that is the reduction in recurrence rate of Tumor. The most dangerous complication is recurrence that is more after use of MMC in our study.

In a study of DI Stasi et al, cystitis and hematuria are noted in 66% and 72.7% patients after use of BCG. Same is the result of our study in case of cystitis with 41% patients developed after BCG but only 2% patients developed hematuria that was opposite to the respective study. The study showed 16% hematuria and 16% cystitis after use of MMC but in our study Hematuria was found among only 6% of patients whereas 30% patients developed Cystitis after use of MMC.¹⁶

In a study by Correa et al, the use of BCG showed 38% recurrence in 12 months and 27% recurrence after 24 months. But in our study, the use of BCG has showed the 2% recurrence after follow up period of 6 months. Many subsequent reports have supported the use of BCG in decreasing the recurrence of bladder tumor and delaying the progression of the cancer. The AUA Guidelines have recommended the use of both agents as treatment of bladder cancer but are deficient of defining clear criterion for the choice of agents. The studies conducted by the European Organisation for Research and Treatment of Cancer (EORTC) have ended result less.¹⁷

CONCLUSION

Our study concluded that the use of Bacillus Calmette Gureau (BCG) is better than Mitomycin C with regard to its effect on decreasing the recurrence and subsequently lessening the progression of the cancer in urinary bladder. Though, the MMC has decreased occurrence of other side effects as compared to BCG but former has limited role in reducing the recurrence.

Author's Contribution:

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Conflict of Interest: The study has no conflict of interest to declare by any author.

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