



CREATION OF MICROSOFT EXCEL® WORKSHEET FOR THE GENERATION OF BCG SCHEDULE AND ITS INITIAL EVALUATION.

Urology

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ABSTRACT

Introduction: Intravesical BCG therapy is one of the only proven treatment which reduces both recurrence and progression of carcinoma bladder post TURBT. The BCG schedule starts with a six weekly induction course followed by a three weekly administration at 3 months. This is followed by a three weekly dose at 6, 12, 18, 24, 30 and 36 months. The schedule is long and is often tedious to calculate. Moreover, the schedule is problematic for the patients to remember and follow. **Aim:** We aimed to create an Excel worksheet to determine the schedule of BCG administration in patients. And to evaluate the created schedule regarding ease of understanding for both clinicians and patients. **Methods:** We created a worksheet on Microsoft Excel and using the date of first administration as the beginning point calculated the full schedule of BCG administration upto the prescribed duration of 36 months. This schedule was then given to 10 patients of carcinoma bladder who were to be taken on BCG prophylaxis. The feedback of patients and clinicians was taken regarding the ease of understanding. The patients were given a printed schedule and were followed up. **Results:** Of all the patients who underwent TURBT during the study period, from July 2019 to February 2020, 8 patients were taken on BCG intravesical therapy. All the patients and clinicians involved in the study reported that the schedule was easy to understand and follow. **Conclusion:** The worksheet was successful in generating a complete schedule from the date of first dose. Both clinicians and surgeons reported increased ease of understanding of the schedule.

KEYWORDS

Introduction

Bladder cancer is one of the most common urological malignancies affecting the Indian population. It ranks 9th among the most common malignancies constituting 3.9% of all malignancies[1]. The incidence of carcinoma bladder is three times more common in men as opposed to women. 90% of bladder tumors are transitional cell carcinomas[2]. Around 40-45% of patients present with high grade lesions, more than half of which present with muscle invasion[3]. Thus, the most commonly seen lesions are non muscle invasive lesions which are primarily treated with trans urethral resection of carcinoma bladder. Non muscle invasive tumors can be divided into low, intermediate and high risk of recurrence. Post TURBT, low and intermediate risk lesion recurrence can be prevented by a single dose intravesical chemotherapy using mitomycin C[4]. However, for the tumors of intermediate and high risk of recurrence post-operative intravesical instillation of BCG is given after 2 weeks. BCG is the only therapy that decreases the risk of both progression and recurrence[5].

BCG is an immunotherapeutic agent which reduces the risk of both recurrence and tumor progression by causing local inflammation. It is administered as six weekly doses in the induction phase followed by three weekly doses at 3, 6, 12, 18, 24, 30 and 36 weeks[6]. The schedule as is evident is long as well as complicated and is often difficult for clinicians to calculate. Moreover, patients are often confused regarding the date of BCG instillation and this may lead to missing of a dose.

Aim

To create a Microsoft Excel® worksheet to calculate the entire schedule of BCG instillation starting from the day of first administration. And to evaluate the ease of understanding for both clinicians and patients.

Methods

The present study is a prospective observational study conducted from July 2019 to February 2020. We created a new worksheet in Microsoft excel and entered the date of TURBT and the planned check cystoscopy after two weeks. The day of the first dose of BCG administration was then entered. In the next row, the date of the next dose i.e. the second dose was calculated using the formula “cell no. + 7” (Fig. 1) similarly, the first six doses were calculated. The dates of the first continuation dose at 3 months was calculated using the formula “EDATE(cell no.,3)” (Fig 2). The dates of the next two doses were calculated using the date of the first dose cell no. with the first formula

“cell no. + 7”. These formulae were used to calculate the dates of the first doses at 6, 12, 18, 24, 30 and 36 months[7]. So by entering a date in the cell which contained the date of the first dose, we obtained the entire dose schedule for 36 months. To the initial framework we added the day of the week at which the dose is planned.

	Date	Day	Y/N	Side effects
Induction	19-03-2020	Thursday		
	26-03-2020	Thursday		
	02-04-2020	Thursday		
	09-04-2020	Thursday		
	16-04-2020	Thursday		
	23-04-2020	Thursday		
Cystoscopy finding:				
Maintenance				
M1	19-06-2020	Friday		
	26-06-2020	Friday		
	03-07-2020	Friday		

Fig 1. Showing the use of the formula “cell no.+7” to calculate the date of next weekly dose.

	Date	Day	Y/N	Side effects
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	02-04-2020	Thursday		
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Cystoscopy finding:				
Maintenance				
M1	19-06-2020	Friday		
	26-06-2020	Friday		
	03-07-2020	Friday		

Fig 2. Showing the use of the formula “EDATE(cell no.,no. of months)” to calculate the first dose at 3 months.

The patients who had a low risk of progression and were kept on observation after single-dose post-operative mitomycin C. The patients, who on check cystoscopy had no residual mass and the repeat biopsy was negative, were taken for intravesical BCG administration. At the time of the first dose of administration, both the clinician and the patient were provided with the schedule made from the worksheet. This dose schedule was printed and handed over to the clinician as well as the patient. Both the clinician and the patients were questioned regarding the ease of understanding the schedule at the time. This was assessed again at the followup visits for subsequent doses.

RESULTS

During the study, we performed 14 TURBTs in our institute. Of these ten patients were diagnosed with nonmuscle invasive transitional cell carcinoma with histopathological assessment. Two patient had low risk of progression and were given only mitomycin C. A total of 8 patients were taken for intravesical BCG instillation and provided with the schedule. Of these 8 patients one patient developed a recurrence and underwent a repeat TURBT. One patient was lost to followup.

Clinicians and all 8 patients who were included in the study expressed that the whole schedule given on a single page was easy to understand. The clinicians also reported an ease of followup of these patients as a soft copy of the schedule could be kept on the department computer.

DISCUSSION

The use of Microsoft Excel for creation of schedules has been used for a variety of situations. The software is most commonly used to analyze data for research. Hospitals frequently use it to determine the duty schedules of doctors and nurses. In one such study conducted by Irwin et al. the authors found an increase in staff satisfaction, time saved by the head nurse, and staff work time saved because there was less arguing about the schedule. This led them to use the software for the work schedule of the entire 700 bedded hospital[8]. The software has formulae for showing the exact date a specific duration away from the first date such as "cell no.+ no. of days" for days and 'EDATE(cell no.,no. of months) and these formulae were used to determine the schedule for administration of BCG administration.

An analog calculation is both complicated and time-consuming. It often requires a calendar which may or may not be available. Besides, it is difficult to explain to the patients. This problem was solved in our study by creating an excel worksheet to calculate the exact schedule for each patient. Moreover, in cases of recurrence where repeat TURBT is to be performed, a new schedule can be calculated using the same worksheet.

Patients often report confusion regarding the exact date for the administration of BCG. With this worksheet, we were able to provide a printed personalized schedule for each patient to follow and to come on the specific date. The patient expressed ease of understanding regarding the same, and this led to a decrease in confusion.

To the best of our knowledge, this is the first time a study has been reported in literature regarding the use of Microsoft Excel worksheets to determine the dosage schedule for drug administration.

One of the drawbacks of our study was a small number of cases, and a more extensive study might provide a more significant result. Another drawback of the study was its small duration as compared to the duration of the intravesical BCG administration, and longer duration of evaluation is needed to predict the effect of this software on loss to followup and patient compliance.

CONCLUSION:

The use of Microsoft Excel worksheet to create a complete schedule is a novel approach which has reported a clear advantage in terms of ease of understanding as compared to an analog dosage schedule. However, more extensive studies are needed to confirm the advantages of this approach regarding followup and patient compliance.

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