

## **The Effectiveness of Bacillus Calmette-Guerin (BCG) Maintenance Treatment in Intermediate and High Risk Non-Muscle-Invasive Bladder Cancer (NMIBC)**

**Introduction and Objectives:** Recently a study on Bacillus Calmette-Guerin (BCG) maintenance treatment was reported to be ineffective in reducing recurrence rate and progression rate in high risk non-muscle-invasive bladder cancer (NMIBC). This study was conducted to analyze the effectiveness of BCG maintenance treatment in intermediate risk and high risk NMIBC.

**Materials and Methods:** Between January 2000 and June 2008, 285 patients with a superficial bladder cancer were treated with a transurethral resection of the bladder tumor (TURBT) and intravesical BCG. Intermediate risk and high risk were categorized according to 2009 European Association of Urology (EAU) guidelines. Six weeks instillation group was instilled BCG once per week for six weeks after TURBT and maintenance instillation group was instilled BCG after six weeks instillation, continuously for more than one year and more than a total of 15 times. The six weeks group and maintenance instillation group of intermediate, high risk NMIBC treated with BCG were compared with recurrence rate and progression rate respectively.

**Results:** Of the 285 cases, mean age was 62.5 (55-78) years; mean follow-up period of 16.4 (9-49) months with total recurrence rate 33.3% (95/285) and total progression was 20% (57/285). The six weeks instillation group was 200 cases (intermediate risk 170/200, high risk 30/200), maintenance instillation group was 85 cases (intermediate 21/85, high risk 64/85). Of the intermediate risk group, the recurrence rate of 6 weeks instillation group and maintenance instillation group was 32.3% (55/170), 14.2% (3/21), the progression rate was 21% (36/170), 19% (4/21) respectively ( $p=0.089$ ,  $p=0.789$ ). Of the high risk group, the recurrence rate of 6 weeks instillation group and maintenance instillation group was 32.3% (10/30), 26.5% (17/64). The progression rate 32.3% (10/30), 10.9% (7/64) respectively ( $p=0.625$ ,  $p=0.019$ ), which showed no statistical difference in the recurrence rate but statistically significant difference in progression rate.

**Conclusions:** Our study reveals there was no statistical difference in recurrence and progression rate between six weeks instillation group and maintenance instillation group; however, the maintenance instillation treatment was effective in reducing progression rate in high risk group. In other words, the BCG maintenance instillation applied for more than one year will be very effective for preventing progression on high risk NMIBC.