Table. 1 Extracted data of included studies

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Abdelrahman *et al*.(2019)[16] | IHC>30% | 60 | 52(Median) | 71.70 | 44(mean) | Non-muscle-invasive bladder cancer (NMIBC) | tumor recurrence, progression, recurrence-free survival (RFS) and progression-free survival (PFS); grade |
| Bolenz *et al*.(2010)[17] | IHC>10% | 198 | 66.7(Median) | 78.8 | 48.7 (mean) | non-muscle-invasive and muscle-invasive bladder cancer | recurrence; lymph node metastasis; grade |
| Soria *et al*.(2016)[18] | IHC>30% | 354 | 66.3(Median) | 81 | 123(mean) | muscle invasive and very high-risk non–muscle invasive bladder cancer | oncological outcomes; grade |
| Moustakas *et al*.(2010)[19] | IHC>10% | 48 | 68(mean) | 97.3 | not specific | non-muscle-invasive urothelial cell carcinoma of the bladder | Grade at diagnosis；recurrence-free survival (RFS) |
| Olsson *et al*.(2011)[20] | IHC>30% | 201 | 73(Median) | 83 | 58(median) | non-muscle-invasive bladder cancer | tumor size, multiplicity, possible presence of histologically proven recurrence and progression; grade |
| Behnsawy *et al.*(2011)[21] | IHC>10% | 161 | not specific | 85.1 | not specific | non-muscle-invasive bladder cancer | recurrence condition |
| Inoue *et al*.(2014)[22] | IHC>10% | 95 | not specific | 72.6 | 36(median) | muscle-invasive bladder carcinoma | recurrence condition |
| El *et al*.(2017)[23] | IHC>30% | 103 | 63(Median) | 93.2 | not specific | non-muscle-invasive and muscle-invasive bladder cancer | Tumor size; Tumor grade |
| Paul *et al*.(2012)[24] | IHC>30% | 178 | 71(mean) | not specific | 82 (mean) | non-muscle-invasive bladder cancer | Recurrence; progression |
| Hegazy *et al*.(2015)[25] | IHC>20% | 88 | not specific | not specific | 36(median) | non-muscle invasive (NMI) bladder cancer | tumor recurrence and progression; grade |
| Lim *et al*.(2015)[26] | IHC≥50% | 141 | 68.9(mean) | 86.5 | 73.3(mean) | non-muscle-invasive bladder cancer | progression; recurrence; tumor size; grade |
| Krüger *et al*.(2002)[27] | IHC>10% | 138 | 64(Median) | 80.4 | 53(mean) | muscle-invasive bladder carcinoma | grade; lymph node metastasis |
| Kolla *et al*.(2008)[28] | IHC>10% | 90 | 58(mean) | 95.6 | 46(median) | muscle invasive urinary bladder cancer | grade; lymph node metastasis |
| Ding *et al*.(2015)[29] | IHC>10% | 238 | 68(Median) | 81.9 | 47(median) | non-muscle-invasive bladder cancer (NMIBC) | Tumor size; recurrence; progression; grade |
| reference | method | Number | age | Male% | Follow-up (months) | tumor type | outcomes |

IHC: immunohistochemistry