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Title

Bladder cancer surveillance in patients with spinal cord injuries

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COMMENTARY

Bladder tumours represent a significant burden of disease worldwide, with high recurrence rates and mortality. Prompt diagnosis and treatment are essential as part of the management of this disease. Smoking, family history of bladder cancers, occupational exposure, and chronic bladder irritation, increase suspicion of a possible bladder cancer(1). The presence of a spinal cord injury (SCI) can subject individuals to many of these risks. A combination of neurogenic sequelae post-SCI, urinary stasis, increased risk of urinary tract infection, as well as greater need for use of urinary catheterisation, all contribute to the higher risk of bladder tumour development(1). However, further guidance and higher quality evidence are still required in order to inform protocol for performing the screening of patients with SCI for bladder cancers.

Bladder cancer incidence in patients with SCI has been described in reports spanning over the last 50 years. The findings from most of these studies reiterate the greater risk of bladder cancer seen in this particular patient subset, compared to the general population. Although the majority of relevant incidence studies were single-centre retrospective audits in nature, a recent meta-analysis reported an overall incidence of 6% (95% confidence interval [CI]: 5-6%)(2). This contrasts with the worldwide reported cumulative risk to age 75, for bladder cancer, of 0.6%(3). A contributing factor within the SCI population is the use of long-term indwelling catheterisation (IDC), where mean duration of use has been reported as 16 years(2). Long term IDC use however only represents one of the many factors that predispose patients with SCI to greater risk of bladder cancer. In association, there is a large length of time to diagnosis of bladder cancer. The mean interval between SCI and diagnosis of bladder cancer has been reported as 24 years(2). This length impacts guideline creation, where the length of surveillance must be determined. Studies have also examined the impact of SCI on mortality rate from bladder cancer diagnosis. The one-year overall survival rate after treatment of bladder

cancer in these patients with SCIs was 62.1% upon meta-analysis of all available data(2). Due to the expected delays associated with diagnosing these tumours, patients may only initiate treatment when the disease progresses to an advanced stage, where prognosis is worse. The highlighted incidence and mortality rates for bladder cancer in patients with SCI therefore direct us towards examining what can be done to reduce this disease burden.

One avenue for improving bladder cancer management for patients with SCI is through asymptomatic surveillance. The surveillance of bladder cancer in patients with SCI has been previously reviewed, though high quality original evidence is lacking. Reported techniques include the use of urinalysis, urine cytology, bladder ultrasound, cystoscopy, and random bladder biopsy(4). The most widely studied method has been the use of cystoscopies; most studies have advocated for the use of annual cystoscopies without formally demonstrating survival benefits of this intervention. One case-control study has conversely reported longer survival in patients without regular cystoscopy screening, although these findings are impacted by the study's observational and retrospective design, and its small sample size(5). Despite this, the sensitivity for diagnosing bladder cancers has been described for cystoscopies (64%, 95% CI 49.3-76.5) and urine cytologies (36.3%, 95% CI 21.5-54.3%), which if combined, may be a useful method to increase the diagnostic likelihood for detecting bladder cancers(2).

Currently, there is no guidance outlined by any urological or oncological body for surveillance of patients with SCI, specifically for bladder cancer. Only the European Association of Urology (EAU) has explicitly recommended against routine screening for bladder cancer, although this refers to the general population, not to patients with SCI(6). The decision to withhold any formal outlined recommendation is an understandable, due to the limited evidence, as well as the potential short lead-time of these tumours, impacting the feasibility and cost-effectiveness of screening. Instead, various bodies have provided differing expert opinions on recommended follow-up of patients with SCI, for urological surveillance, not specific to bladder cancer. The EAU has recommended six-monthly urinalysis, renal ultrasound, and post-void residual volumes, with annual clinical examination, blood tests and urodynamics. A recent Spinal Cord Injury Think Tank recommended the use of annual renal ultrasound, creatinine clearance, and a frequency-volume chart for long term follow-up of patients with SCI(4). Nevertheless, there is a lack of available evidence for bladder cancer surveillance, and a need for future study of the effectiveness of screening in this high-risk population.

The study of bladder cancer surveillance in patients with SCIs demands greater attention, due to the increased incidence and mortality compared to the general population. Although various surveillance methods have been described, studies of higher quality should be pursued to establish the most effective way to monitor individuals with SCIs. Guidelines should subsequently be implemented to ensure that individuals with SCIs are being managed with best clinical practice.

REFERENCES

1. Groah SL, Weitzenkamp DA, Lammertse DP, Whiteneck GG, Lezotte DC, Hamman RF. Excess risk of bladder cancer in spinal cord injury: evidence for an association between indwelling catheter use and bladder cancer. *Arch Phys Med Rehabil.* 2002;83(3):346-51.
2. Gui-Zhong L, Li-Bo M. Bladder cancer in individuals with spinal cord injuries: a meta-analysis. *Spinal Cord.* 2017;55(4):341-5.
3. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. *Int J Cancer.* 2015;136(5):E359-86.
4. Cameron AP, Rodriguez GM, Schomer KG. Systematic review of urological followup after spinal cord injury. *J Urol.* 2012;187(2):391-7.
5. Groah SL, Lammertse DP. Factors associated with survival after bladder cancer in spinal cord injury. *J Spinal Cord Med.* 2003;26(4):339-44.
6. Babjuk M, Bohle A, Burger M, Capoun O, Cohen D, Comperat EM, et al. EAU Guidelines on Non-Muscle-invasive Urothelial Carcinoma of the Bladder: Update 2016. *Eur Urol.* 2017;71(3):447-61.

Conflicts of interest

The authors declare no conflicts of interest relevant to this manuscript.

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