Adverse Effects of Cystoscopy and its Impact on Patients' Quality of Life and Sexual Performance

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Abstract

Background: Cystoscopy, the principal means of diagnosis and surveillance of bladder tumors, is invasive and associated with unpleasant side effects

Objectives: To determine the early complications of rigid cystoscopy and the impact on patients' quality of life and sexual performance.

Methods: One hundred consecutive patients undergoing diagnostic rigid cystoscopy filled in questionnaires that included anxiety and pain levels (0–5 visual analogue scale), adverse events, Short-Form Health Survey, International Prostate Symptom Score, and functional sexual performance. Questionnaires were administered before, immediately after, and 1, 2 days, 2 and 4 weeks following cystoscopy.

Results: The pre-cystoscopy anxiety level was 2.01. The average pain during the examination was 1.41. SF-36 score was not affected by cystoscopy. The subjective impact on patients' quality of life was 0.51. The mean IPSS increased following cystoscopy (6.75 vs. 5.43, $P = 0.001$) and returned to baseline 2 weeks later. A decline in libido was reported by 55.6% (25/45) and 50% (3/6) of the sexually active men and women, respectively. Cystoscopy was associated with a decreased Erectile Dysfunction Intensity Score, from 15.6 to 9.26 during the first 2 weeks ($P = 0.04$). The overall complication rate was 15% and included urethrorrhagia and dysuria. None of the patients had fever or urinary retention and none was hospitalized. The complication rate was higher in patients with benign prostatic hyperplasia (24% vs. 9.7%, $P = 0.001$).

Conclusions: Rigid cystoscopy is well tolerated by most patients and has only a minor impact on quality of life. However, cystoscopy transiently impairs sexual performance and libido. The early complications are mild and correlate with a diagnosis of BPH.

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During the last 150 years cystoscopy has become a major diagnostic procedure in the urologic armamentarium. Cystoscopy is usually performed once in a lifetime, but since it is the principal means of diagnosis and surveillance of bladder tumors, patients with bladder cancer undergo cystoscopy repeatedly [1].

Although performed as an office procedure, cystoscopy is invasive and is often perceived as unpleasant and potentially associated with side effects. In view of the paucity of reports on complications associated with cystoscopy, our purpose was to determine the adverse effects of cystoscopy and its impact on patients' quality of life.

SF-36 = Short-Form Health Survey
IPSS = International Prostate Symptom Score
BPH = benign prostatic hyperplasia

Patients and Methods

The study sample consisted of 112 consecutive patients referred for diagnostic cystoscopy. Excluded were patients with urethral stricture or those needing further intervention including stent insertion or removal, bladder biopsy or fulguration.

A rigid 17F (diagnostic) cystoscope was used. Fifteen minutes before the procedure 20 ml of 2% lignocaine jelly were instillated into the urethra [2–4]. All patients received prophylactic intramuscular gentamycin 80 mg 10 minutes before the procedure [5]. The following parameters were assessed during the procedure: duration of the procedure, cystoscopic findings, and anatomic abnormalities.

Before the procedure, patients reported their pretreatment anxiety level on a visual analogue scale rating of 0 (none) to 5 (maximal). Patients completed the SF-36 [6,7], IPSS [8] and EDIS [9] questionnaires before cystoscopy, and 2, 14 and 30 days following the procedure [see Appendix]. Pain level was evaluated immediately, 1 day, 2 days and 14 days after cystoscopy, using a visual analogue scale rating of 0 (none) to 5 (maximal). Adverse events were assessed 14 days following cystoscopy. Midstream urine cultures were taken before cystoscopy, immediately after and 4 days later.

Statistical analysis

Statistical analysis was performed using SPSS computer software. Comparisons of nominal data between groups were performed using the chi-square test, and continuous data were examined using the two-tailed, unpaired *t*-test. A *P* value less than 0.05 was considered significant.

Results

One hundred patients (78 men and 22 women) completed the study. Of 112 consecutive patients, 108 patients initially entered into the study but 8 were excluded from analysis due to incomplete questionnaires. The median age was 67 years (range 20–90 years). Indications for cystoscopy included bladder cancer surveillance in 69, and evaluation of hematuria or lower urinary tract symptoms in 24 and 7 patients, respectively. The mean procedural duration was 187.7 seconds (range 60–510 seconds). Cystoscopy revealed normal bladder in 81 patients, tumor in 11, hyperemia in 5, and cystolithiasis in 3. Twenty-two patients had never undergone the procedure before. Twenty-five patients had benign prostatic

EDIS = Erectile Dysfunction Intensity Score

hyperplasia according to the IPSS, and objective evidence of prostatic enlargement either by rectal examination or by cystoscopy (prostatic urethral length, elevated posterior verge). Thirty patients were working regularly, and none of them lost labor days before or after the procedure.

The mean pre-cystoscopy anxiety level was 2.01, as attributed by 88% of the patients to the potential pathologic findings rather than to the anticipated procedure. None of the patients took tranquillizers before the cystoscopy. Patients younger than 67 years were significantly more anxious than older patients (2.34 vs. 1.72, P = 0.003) [Table 1]. The mean pre-cystoscopy anxiety level was not influenced by gender (men 2.27, women 1.94; P = 0.19). The mean pre-cystoscopy anxiety level was similar in patients who had not undergone the test before and those who had (2.08 vs. 1.77, P = 0.24).

The average pain level decreased progressively following cystoscopy – 1.41, 1.06, 0.51 and 0.32 – immediately, 1 day, 2 days and 2 weeks, respectively [Table 2]. Ten patients required analgesics during the first 48 hours after the examination, after which none took analgesics. No correlation was found between pain and duration of the procedure (P = 0.17), the presence of BPH (P = 0.69), patient's gender (P = 0.37) and age (P = 0.44), and patients undergoing cystoscopy for the first time (P = 0.16). Ninety-six percent reported that the procedure was less or as painful as expected, and 98% said that they would undergo the examination again if necessary.

The mean IPSS sum-score was significantly higher 2 days following cystoscopy than before the procedure (6.75 vs. 5.43, P = 0.001), returning to baseline level 2 weeks later (5.41) [Table 2]. No correlation was found between the rise in mean IPSS sum-score and procedural duration (P = 0.5) or the presence of BPH (P = 0.9).

There were no differences between the overall results of the SF-36 quality of life questionnaire before and 2 weeks after the procedure (before 15.97, after 16.04; paired t-test, P = 0.61) [Table 3]. The mean score of the estimated subjective impairment of quality of life caused by the cystoscopy was 0.51 on a 6-point visual analog scale.

Fifty-one percent of the patients were sexually active (45 men and 6 women). Among sexually active men the mean pre-cystoscopy EDIS score was 15.61, which decreased to 9.26 during the first 2 weeks (P = 0.04) [Table 3]. Two weeks following cystoscopy 76.5% (39/51) of the sexually active patients reported impaired satisfaction from sexual relations. Furthermore, 55.6% (25/45) and 50% (3/6) of the sexually active men and women, respectively, reported a decline in libido [Table 3].

None of these patients experienced pain or discomfort during sexual intercourse. One month after cystoscopy, libido, satisfaction from sexual intercourse, and the mean EDIS score returned to baseline in all patients. None of these parameters was influenced by the gender of patients (P = 0.32) or the examination findings (P =0.43).

None of the patients had fever or urinary retention and none was hospitalized [Table 4]. Dysuria was reported in 11% and urethrorrhagia in 7%. Both symptoms resolved spontaneously within the first 2 days of cystoscopy. The overall complication rate was 15% without a significant difference between genders (men 15.4%, women 13.6%; P = 0.5). The incidence of urethrorrhagia was not significantly higher in patients taking antiplatelet medication (8.3% vs. 6.3%, P = 0.49). The overall complication rate was significantly higher in patients with BPH (24% vs. 9.7%, P = 0.001) and did not correlate with duration of the procedure (P = 0.2). The complication rate was high when the examiner subjectively estimated that the procedure was technically difficult (30.8% vs. 12.6%, P = 0.001).

All urine cultures before the procedure were sterile. Positive urine cultures were observed in two patients 4 days after cystoscopy (2%), from which *Citrobacter koseri* and *Stenotrophomonas maltophilia* were isolated. Neither patient was symptomatic.

There were no differences between examiners regarding the subjective pain perception estimated by the patients, the impact on quality of life, sexual performance, and complication rate.

Table 1. Pre-cystoscopy anxiety level (mean 2.01, visual analogue scale 0–5)

Age (yrs)		Gender		First cystoscopy	
< 67	2.34	Male	2.27	Yes	2.08
⩾ 67	1.72*	Female	1.94	No	1.77

*P < 0.01

Table 2. Pain level (visual analogue scale 0-5) and IPSS

Pain level after cystoscopy		IPSS sum score	
Immediately	1.41	Before	5.43
1 day	1.06	2 days after	6.75*
2 days	0.51	2 weeks after	5.41
2 weeks	0.32		

* P < 0.01

Table 3. SF-36 and sexual performance

SF-36		EDIS score among sexually active men		Decline in libido among sexually active patients	
Before	15.97	Before	15.61	Men	25/45 (55.6%)
2 weeks after	16.04	2 weeks after	9.26*	Women	3/6 (50%)

* P < 0.05

Table 4. Complications after cystoscopy

Complications description (No.)		Complication rate (%)	
Dysuria	11	Overall	15
Urethrorrhagia	7	Women	13.6
Bacteriuria	2	Men	15.4
Fever	0	BPH	24
Urinary retention	0	No BPH	9.7*

* P < 0.01

Discussion

In the current study the pre-cystoscopy anxiety level was significantly higher in young patients. As expected, the overall level of pain was maximal immediate after the procedure and decreased progressively during the following 2 weeks. Only 10% of patients required analgesics for 2 days after the procedure. Nearly all patients reported that the procedure was less painful than they expected and stated that they would undergo the test again if

necessary. The SF-36 results were not influenced by cystoscopy. Moreover, the mean score of the estimated impairment of quality of life was low. The length of the procedure and the presence of BPH did not correlate with pain or discomfort. These findings are not in line with our initial hypothesis and thus warrant further validation.

We found that rigid cystoscopy had a transient negative impact on lower urinary tract symptoms and sexual well-being. Among sexually active men the mean pre-cystoscopy EDIS score decreased significantly during the first 2 weeks after the procedure and returned to baseline level after 1 month. Three of four sexually active patients reported impairment in their satisfaction from sexual intercourse and half reported a decline in libido.

The overall complication rate in the current study was 15% and included minor complications such as urethrorrhagia and dysuria. None of the patients had a major complication such as fever or urinary retention, and none was hospitalized.

The reported incidence of serious complications during and following diagnostic cystoscopy is extremely low [1,10]. The incidence of complications significantly increases when other non-diagnostic procedures are performed during cystoscopy (e.g., biopsy, insertion of ureteral stent, urethral dilatation) [10].

Instrumentation in the lower urinary tract is a predisposing factor for development of urinary tract infection. In our study there were two cases of asymptomatic bacteriuria, indicating a low possibility of infection. Another study, a prospective, comparative and randomized study of 2,284 patients who had a previous negative urine culture, evaluated the incidence of infective complications following cystoscopy [11]. Symptomatic bacteriuria was observed in 2.5% of patients who received prophylactic antibiotics and 10.2% of patients in the control group ($P < 0.0001$). The incidence of asymptomatic bacteriuria was 1.5% and 3%, respectively (not statistically significant). Almallah et al. [12] reported a 4.5% asymptomatic and 1% symptomatic bacteriuria rate following flexible cystoscopy. Arpi and collaborators [13] reported a 21% rate of bacteremia (7 of 11 patients) following cystoscopy. However, none of the patients received prophylactic antibiotic treatment, and the majority (97%) had positive urine culture before the procedure. The incidence of asymptomatic bacteriuria in our study (2%) was the same as reported previously [11].

Few studies have evaluated pain perception and tolerance among patients undergoing cystoscopy; in most of them flexible cystoscopes were used. Herr and Schneider [14] studied 288 patients with superficial bladder tumors undergoing outpatient flexible cystoscopy after intraurethral instillation of lidocaine jelly. The mean pain score on a scale of 1 (no pain) to 4 (severe pain) was 1.6. The mean visual analogue scale score on a scale of 1 (no pain) to 10 (most painful) was 1.8. Almallah and his team [12] reported that 82.5% of the patients who underwent flexible cystoscopy (166/201) said that the procedure was more bearable than they expected, and 99.5% (200/201) said they would undergo the examination again if necessary. Burke et al. [15] reported a median pain score of 1.1 (linear scale 0–10) in 384 patients who underwent flexible cystoscopy, and 382 patients (99.5%) declared they would be willing to undergo an identical procedure in the future if medically indicated. Pain on voiding was reported in 190 patients (50%), urinary frequency in 142 (37%) and gross hematuria in 73 (19%).

Denholm and co-workers [16] compared the preference and postoperative symptoms in 100 patients undergoing local anesthetic flexible cystoscopy with those in 100 patients undergoing general anesthetic rigid cystoscopy. Eighty-nine percent found flexible cystoscopy to be painless and 92% expressed a preference for the same procedure on a future occasion. The incidence of postoperative symptoms was 33% following flexible cystoscopy and 76% following rigid cystoscopy. The results suggest that flexible cystoscopy was well tolerated and preferred by most patients. However, the comparison was inadequate because of the different anesthetic methods used in the two groups.

All the published studies on flexible cystoscopy concluded that the procedure is well tolerated. However, none of them evaluated the impact of the procedure on the patients' quality of life, sexual performance and libido. Although flexible cystoscopy has become the gold standard diagnostic procedure, many urologists continue to perform rigid cystoscopy by choice or because the technology of flexible cystoscopy is unavailable.

Based on our findings, younger patients are more anxious prior to cystoscopy, and perhaps mild sedation or a tranquilizer is indicated. Discontinuation of antiplatelet medication may not be necessary since the incidence of urethrorrhagia was not significantly higher in this group.

Our study was limited by the absence of a long follow-up and possible data on permanent and late sequelae. Although our study group comprised 100 patients, only common side effects could be identified. Due to the sample size this study is underpowered to define complications less frequent than 1%. This could be the reason why none of our patients had symptomatic bacteriuria or a major complication. It may be possible that with a larger study cohort the marginal differences that we found would have become significant.

Conclusions

Rigid cystoscopy is well tolerated by the majority of patients and has only a minor impact on quality of life. The early complications are mild and rare. The examination transiently impairs functional sexual performance and libido in sexually active patients.

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APPENDIX: Study Questionnaires

Day 0 Interview (filled out before cystoscopy)

1. First cystoscopy ever? No/Yes
2. Do you work? No/Yes
3. During the period between knowing that you needed a cystoscopy and today, did you miss working days? If yes, how many? _____/No
4. Please state the reason(s) for your work loss. (Free text)
5. Please grade the amount of anxiety you experienced in the period between knowing that you needed a cystoscopy and today. 6-Point visual analog scale.
6. Please state the reason(s) for your anxiety? Finding/ Procedure/ Else.
7. Did you start to take tranquillizers or increase the dose of an ongoing tranquilizer treatment? No/Yes
8. Please state the reason(s) you took tranquilizers. (Free text)
9. Aspirin treatment within the last 10 days? No/Yes
10. Coumadin treatment within the last 10 days? No/Yes
11. Did you take antibiotic oils before the procedure? No/Yes
12. Type of antibiotics_____
13. Do you have sexual intercourse regularly? No/Yes
14. (For men) Did you have a problem achieving erection before you were told that you needed a cystoscopy? No/Yes
15. (For men) Did you have a problem achieving erection after you were told that you needed a cystoscopy? No/Yes
16. Baseline validated Hebrew Erectile Dysfunction Intensity Scale (for men).
17. Baseline validated Hebrew International Prostate Symptoms Score.
18. Baseline validated Hebrew SF-36 self-administered questionnaire.

(Filled out immediately after the cystoscopy)

19. Please grade the amount of pain you experienced during cystoscopy. 6-Point visual analog scale.
20. Did the pain and discomfort match your expectation? Less/As expected/More/No comment.
21. If necessary, will you undergo the test again? No/Yes

Day 1 Self-Administered Questionnaire

22. Please grade the amount of pain and discomfort you experienced during the first day after cystoscopy. 6-Point visual analog scale
23. Did you use pain relief treatment during the first day after the cystoscopy? No/Yes
24. Which pill type did you use? _____
25. How many pills did you take on that day? _____

Day 2 Self-Administered Questionnaire

26. Day 2 validated Hebrew International Prostate Symptoms Score.
27. Please grade the amount of pain and discomfort you experienced during the second day after cystoscopy. 6-Point visual analog scale
28. Did you use pain relief treatment during the second day after the cystoscopy? No/Yes
29. Which pill type did you use? _____
30. How many pills did you take on that day? _____

Day 14 Interview

31. Day 14 validated Hebrew Erectile Dysfunction Intensity Scale (for men).
32. Day 14 validated Hebrew International Prostate Symptoms Score.
33. Day 14 validated Hebrew SF-36 self-administered questionnaire.
34. Did you have fever >38^{0}C after the cystoscopy? Yes date: __ – __ – __ / No
35. What was the maximal fever reading at home? _____^{0}C.
36. Did you experience chills? No/Yes
37. Did you have a burning sensation when you urinated after the cystoscopy? No/Yes, I had this sensation for ___ days.
38. Did you notice blood in your urine after the biopsy? No/Yes, for ___days.
39. Did you encounter a new problem in passing urine or aggravation of an ongoing difficulty after the cystoscopy? No/Yes
40. Was a urinary catheter inserted into your urethra because of urinary retention after the cystoscopy? No/ Yes
41. For how long was the catheter left? ____days/Still with me.
42. Were you hospitalized after the cystoscopy? No/Yes, for ___days.
43. The reason(s) for hospitalization was_____(Free text).
44. During the period between the cystoscopy and now, did you miss working days? If yes, how many? ____/No
45. Please state the reason(s) for your work loss. (Free text).
46. Please grade the amount of pain and discomfort you experience two weeks after cystoscopy. 6-Point visual analog scale
47. Do you use pain relief treatment two weeks after the cystoscopy? No/Yes
48. Which pill type do you use? _____
49. How many pills do you take a day? _____
50. Did your family physician give you antibiotic pills? No/Yes
51. Which antibiotic type did you take? _____
52. Please grade the impairment of quality of life caused by the cystoscopy? 6-Point visual analog scale
53. Did you experience impairment in your satisfaction from sexual relations? No/Yes
54. Did you experience a new impairment in your sexual drive? No/Yes
55. Did you experience a new pain or discomfort during sexual relations? No/Yes

1 month Interview

56. 1 month validated Hebrew Erectile Dysfunction Intensity Scale (for men).
57. 1 month validated Hebrew International Prostate Symptoms Score.
58. 1 month validated Hebrew SF-36 self-administered questionnaire.
59. Did you encounter a new problem in passing urine or aggravation of an ongoing difficulty after the cystoscopy? No/Yes
60. Was a urinary catheter inserted into your urethra because of urinary retention after the cystoscopy? No/ Yes
61. For how long was the catheter left? ____days/ Still with me.
62. Please grade the amount of pain and discomfort you experience now, 1 month after the cystoscopy. 6-Point visual analog scale
63. Did you experience impairment in your satisfaction from sexual relations? No/Yes
64. Did you experience impairment in your sexual drive? No/Yes
65. Did you experience pain or discomfort during sexual relations? No/Yes

Operator Questionnaire (Filled out immediately after the cystoscopy)

66. Operator name: _____
67. Reason for referral (>1 may exist)
    a. Hematuria
    b. TCC follow-up
    c. Lower urinary tract symptoms
    d. Other: _____
68. Cystoscopy duration: ____seconds
69. Visualization quality: Good/Moderate/Bad
70. Finding(s): Normal/Tumor/Hyperemia/Other: _____
71. High posterior urethral verge? No/Yes
72. Prostatic urethra length: ____cm
73. Is the posterior urethra obstructed by an enlarged prostate? No/Yes
74. Was the procedure traumatic? No/Yes

Operator Questionnaire (filled out on day 14 after cystoscopy)

75. Was the urine culture before the cystoscopy positive? No/Yes, Bacterial species_____
76. Was the urine culture four days after cystoscopy positive? No/Yes, Bacterial species_____
77. Was the urine culture two weeks after cystoscopy positive? No/Yes, Bacterial species_____