EFFECT OF INTRARECTAL POVIDONE-IODINE IN THE INCIDENCE OF INFECTIOUS COMPlications AFTER TRANSRECTAL PROSTATIC BIOPSY

Jose María Gil-Vernet Sedo and Ricardo Alvarez-Vijande Garcia.


Summary.- OBJECTIVES: To assess the incidence of genitourinary infections associated with transrectal ultrasound-guided prostate biopsy (TRUS-BX) using endorectal povidone-iodine gel as a bactericidal agent.

METHODS: We prospectively studied a total of 530 patients who were given 30g of 10% povidone-iodine intrarectally before TRUS-BX. Each patient received antibiotic prophylaxis with ciprofloxacin, starting the previous day (1g/day x 3 days), as well as cleansing enemas.

RESULTS: One patient (0.20%) presented with an E. coli acute bacterial epididymitis after biopsy.

CONCLUSIONS: In our study, the intrarectal use of 10% povidone-iodine gel in TRUS-BX is associated with a much lower rate of infectious complications compared to those described in recent literature.


Resumen.- OBJETIVO: Evaluar la incidencia de infecciones genitourinarias asociadas a las biopsias prostáticas transrectales ecoguiadas (BPTRE) utilizando el gel de yodopovidona endorectal como agente bactericida intrarectal.

MÉTODOS: Se evaluaron prospectivamente un total de 530 pacientes a los que se aplicó 30 gr de yodopovidona intrarectal al 10% antes de la realización de BPTRE. En todos los pacientes se realizó profilaxis antibiótica con ciprofloxacino, iniciada el día anterior (1 gr/día/ 3/días) y enema de limpieza.

RESULTADOS: Un paciente (0,2%) presentó una orquiepididimitis bacteriana aguda por E. coli después de la biopsia.

CONCLUSIONES: En nuestro estudio, el uso intrarectal del gel de yodopovidona al 10% en las BPTRE se asocia a una tasa de complicaciones infecciosas muy inferior a las descritas en las series más recientes de la literatura.


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INTRODUCTION

Among the complications due to transrectal prostate biopsies, infections are the most serious. Currently, with prophylactic antibiotics, the risk of genitourinary infection ranges from 2.1 to 10.9% (1,2,3), and the risk of urosepsis between 0.1-1.7% (2,3,4). Knowing that povidone-iodine is a highly effective bactericidal agent when used topically (5), we designed a prospective observational study in 530 patients to determine the rate of infectious complications after TRUS-BX using 10% povidone-iodine gel intrarectally.

MATERIALS AND METHODS

A prospective observational study was designed, conducted from 2007 to 2010, including 530 patients undergoing TRUS-BX, due to PSA greater than 4 ng/ml on two consecutive readings or digital rectal exams suspicious for prostatic neoplasms, with a previous negative urine culture. Patients with known allergy to iodine and quinolones were excluded, as well as those patients with urinary catheter, those who were at risk of infective endocarditis, and patients who were receiving immunosuppressive therapy.

PREPARATION

Between 3-4 hours prior to the intervention a cleansing enema was performed along with oral antibiotic prophylaxis with ciprofloxacin (1g daily) initiated the day before and continued for 3 days. Before insertion of the transducer, 30g of 10% povidone-iodine gel was applied intrarectally, covering the entire surface of the anorectal mucosa as well as the tip of the transducer. With the patient in the left lateral decubital position, and under sedation with intravenous propofol and remifentanil, 10-40 cores were obtained using a 20-gauge needle. In those patients undergoing an initial biopsy, the Vienna nomogram criteria were applied to determine the number of cores necessary, obtaining in addition two cores from each apical-ventral area and two cores from any observed hypoechoic areas. In patients undergoing a second biopsy, saturation biopsies (30-40 cores) were obtained. All of the patients were observed at one week and one month after the procedure, obtaining a urine culture at each visit, to evaluate for possible complications post-biopsy.

RESULTS

The mean age of the series was 65 years (range 39-83 years), the mean total PSA was 11.2 ng/ml (range 2.7-97.4 ng/ml), and the number of cores obtained per biopsy was 21.3 (range 10-40 cores). The percentage of patients biopsied for the first time was 72.4%, and 27.6% were biopsied a second time, with 40.6% diagnosed with prostate cancer. A 14.1% of patients were diabetic. The incidence of post-biopsy genitourinary infection was 1/530 (0.2%). The demographic data of the patients and infectious complications are listed in Table 1. The only infectious complication in the series occurred in a 59 year-old patient without known risk factors who suffered an acute right orchi-epididymitis without fever and a urine culture positive for E. coli resistant to ciprofloxacin, treated with cefuroxime 1 g daily for 10 days. The remainder of the urine cultures collected from patients at one week and one month after the biopsy were negative. No cases of urosepsis occurred. No patient required inpatient

<table>
<thead>
<tr>
<th>Number of patients</th>
<th>530</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (years)</td>
<td>63.8 (41-82)*</td>
</tr>
<tr>
<td>PSA (ng/ml)</td>
<td>11.2 (2.7-97.4)*</td>
</tr>
<tr>
<td>Number of cores</td>
<td>21.3 (10-40)*</td>
</tr>
<tr>
<td>Previous biopsy</td>
<td></td>
</tr>
<tr>
<td>- First biopsy</td>
<td>384 (72.4%)</td>
</tr>
<tr>
<td>- Second biopsy</td>
<td>146 (27.6%)</td>
</tr>
<tr>
<td>Biopsy specimen results</td>
<td></td>
</tr>
<tr>
<td>- Prostate adenocarcinoma</td>
<td>215 (40.6%)</td>
</tr>
<tr>
<td>Post-biopsy urine culture</td>
<td></td>
</tr>
<tr>
<td>- Negative</td>
<td>529 (99.8%)</td>
</tr>
<tr>
<td>- Positive</td>
<td>1 (0.2%)</td>
</tr>
<tr>
<td>Risk factors</td>
<td></td>
</tr>
<tr>
<td>- Diabetes mellitus</td>
<td>76 (14.1%)</td>
</tr>
</tbody>
</table>

* median (range)
hospitalization due to a severe urinary infection. No adverse effects related to the application of povidone-iodine gel were observed.

**DISCUSSION**

Iodine solutions have been used since the 19th century as topical antiseptics given their potent bactericidal activity against both gram positives and gram negatives. The arrival of less irritating iodophores has facilitated the direct mucosal and the peritoneal cavity application. Today, povidone-iodine is used for prophylaxis during ophthalmologic surgery (6), for prevention of puerperal infections (7) and for prophylaxis against post-surgical infections in abdominal surgery (8), demonstrating great antiseptic efficacy.

Between 1980 and 1984, a 10% solution of povidone-iodine was first applied intrarectally to prevent infectious complications during transrectal prostate biopsies, without prior antibiotic prophylaxis. This method had good success rates (9,10), but the procedure was cumbersome as it required the use of an anoscope, and it was given up.

The clinical efficacy of povidone-iodine (200 mg) in suppository was subsequently demonstrated, while concurrently an in vitro study showed a 99.9% reduction in the rectal bacterial population with the use of a povidone-iodine suppository (11). Currently we use 10% povidone-iodine gel, a pharmaceutical preparation that facilitates coating the anorectal mucosa. Unlike that which occurs with antibiotics, the bactericidal efficacy of iodine has not diminished over time (12,13,14), and until now no microbial strains resistant to povidone-iodine have been detected (15).

Since we first began using a 10% povidone-iodine gel intrarectally in 2002, we have observed a significant reduction in the rate of infectious complications after TRUS-BX(16), leading us to conduct the current observational study. Although a clear limitation in our work is the absence of a control group to try the efficacy of povidone-iodine gel, the magnitude of the results obtained suggests that endorectal povidone-iodine gel may play an important role in the prophylaxis of genitourinary infections after TRUS-BX, a finding which should be further verified with a controlled clinical trial.

“We therefore suggest that in addition to traditional antibiotic prophylaxis, local antisepsis be implemented, which provides specific bactericidal action against the microbial population of the anorectal mucosa”.

**CONCLUSIONS**

The incidence of genitourinary infections after transrectal prostate biopsy that we observed is much lower than those described in the literature. Although this involves a descriptive prospective study, the robustness of our results appears to confer an important role to endorectal povidone-iodine gel as a bactericidal agent for prophylaxis against infection. Its ease of use, low cost, absence of microbial resistance and adverse effects, along with a great antiseptic efficacy, in our opinion may transform it into an extremely useful tool to reduce the infectious morbidity of transrectal prostate biopsies.

**REFERENCES AND RECOMMENDED READINGS**

(*of special interest, **of outstanding interest)


