Value of TRUS in the Diagnosis of Chronic Prostatovesiculitis in Infertile Men

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Abstract

Introduction: Chronic Prostatovesiculitis (CPV) is considered a potential cause of infertility that gained a lot of consideration in the last decade. CPV can cause infertility through secretory dysfunction of the accessory glands, increased ROS and obstruction of the seminal ducts. CPV can be symptomatic or asymptomatic, bacterial and none bacterial and it can be present with absence of pus cells in Expressed Prostatic Secretion (EPS). Recently TRUS is considered an important tool for diagnosis of CPV.

Objective: This work aimed to detect the value of TRUS in the diagnosis of CPV in infertile men.

Patients and Methods: This study included 201 infertile men. They were grouped into 4 groups according to semen parameters. Group 1 (37 participants): Low semen volume Azoospermic (AZ), Group 2 (22 participants): Low semen volume olig and/or asthenospermic (OAZ), Group 3 (62 participants): Normal semen volume AZ and group 4 (80 participants): Normal semen volume OAZ.

Expressed prostatic secretion analysis, seminal fructose and serum total testosterone estimation were done for all participants. All were screened by TRUS for evidence of CPV.

Results: TRUS evidence of CPV was detected in 29 (14.2%) participants. Of them: 9 (31%) had low semen volume, 20 (69%) had normal semen volume, 14 (48.3%) were AZ and 15 (51.7%) were OAZ. The percentage of TRUS evidence of CPV among the 4 groups was comparable. All participants with clinical and/or laboratory evidence of CPV had TRUS evidence of CPV. Of the TRUS evident CPV, 13 (44.8%) had normal pus cell count in EPS, 17 (58.6%) had normal pus cell count in semen and 21 (72.4%) had normal seminal fructose. Comparative study among groups for the incidence of increased pus cells in EPS and semen showed insignificant difference.

Conclusion: TRUS may have a role in the diagnosis of CPV in infertile men. TRUS evidence of CPV had comparable incidence in low and normal semen volume infertile men.

Key Words: Infertility – Chronic prostatovesiculitis – TR US.

Introduction

MALE infertility affects about 7% of men [1]. However the great progress in the diagnostic procedures, especially in the field of genetics, the etiology of infertility is still obscure in about 50% of infertile men [1,2]. The search for diagnostic tools to uncover the obscure etiology of infertility in men is still ongoing. Male Accessory Glands Inflammation (MAGI) is considered a potential cause of infertility that gained a lot of consideration in the last decade [3,4]. The prevalence rate of MAGI is different in the published researches [3]. MAGI can present with prostatitis, seminal vesiculitis and/or epididymitis however it can be a silent one [5]. Prostatitis has a prevalence rate of 2.2 to 9.7. Prostatitis can be complicated by seminal vesiculitis and/or epididymitis [6,7]. Chronic prostatitis is more common than acute prostatitis. Chronic prostatitis can be symptomatic or asymptomatic, bacterial and none bacterial and it can be present with absence of pus cells in EPS [8,9]. Currently Neisseria gonorrhoea is replaced by Chlamydia trachomatis, Mycoplasma species, especially Ureaplasma urealyticum, and the gram's negative bacteria as the most common causative organisms of MAGI [5].

MAGI can cause infertility through secretory dysfunction of the accessory glands [10,11], increased ROS [12-14] and obstruction of the seminal ducts [15,16]. Low seminal fructose is a marker of secretory dysfunction, however low seminal fructose can occur in cases of congenital absence of the vas, ejaculatory duct obstruction and partial retrograde ejaculation [5].

Imaging of the male genital tract is now widely used for assessment of the reproductive functions among infertile men [17,18]. TRUS has extended the examination to the prostate and seminal vesicles.
and recently TRUS is considered an important tool for diagnosis of MAGI [16-18].

This work aimed to detect the value of TRUS examination to diagnose cases of Chronic Prostatovesiculitis (CPV) in infertile men with low and normal semen volume.

Patients and Methods

After approval of the Ethics Committee, Faculty of Medicine, Cairo University, and informed consent, this cross sectional prospective study was conducted on infertile men attending the Andrology Clinic of the University Hospital over a period of 6 months.

Each infertile man was subjected to history taking, general and genital examinations. History taking included personal, infertility, medical (including prior genitourinary infections and symptoms of prostatitis), sexual and surgical histories. General and genital examinations included examination of the prostate, testes, epididymes and spermatic cords.

After 2-5 days of abstinence, each infertile man provided a semen sample in a sterile container, by masturbation, for semen analysis [19] at the andrology laboratory of the university hospital. At least two semen analyses were required. Inclusion criteria were infertile men. For each participant a panel of investigations was done and included urine and expressed prostatic secretion analyses, quantitative seminal fructose and morning testosterone levels estimation and TRUS for evidence of CPV. When urine analysis showed normal pus cell a digital prostatic examination was done, with message for expressed prostatic secretion. Pus cells >10/HPF in the prostatic secretion was considered abnormal. Quantitative seminal fructose was performed in a single laboratory using the photometric method. The normal level is ≥150mg%. When seminal fructose was low a post ejaculatory urine analysis for sperm and fructose was done. Morning testosterone was estimated using radioimmunoassay at 8-10AM. Normal range for testosterone is 2.6-15.93ng/dl.

An ultrasound unit with a 7MHZ high frequency end and side fire bi-planar transducer for per rectal examination was used for detection of evidence of CPV during TRUS examination. With a period of abstinence less than 24 hours, after receiving an enema with the urinary bladder at least half full, TRUS was performed in both transaxial and sagittal planes. The prostate was imaged in both planes and the seminal vesicles in the transaxial plane. Dimensions and volume were calculated for the prostate and its echogenicity, calcifications, cyst or any lesion were recorded. Symmetry, length, width, echogenicity and calcifications of both seminal vesicles were recorded. Reference values for normal TRUS were considered [20]. TRUS finding suggestive of CPV is the presence of heterogeneous echogenicity and/or calcification of the prostate and seminal vesicles.

According to semen parameters participants were grouped into 4 groups. Group 1: Low semen volume AZ, Group 2: Low semen volume OAZ, Group 3: Normal semen volume AZ and Group 4: Normal semen volume OAZ.

Descriptive statistics included numbers, percentages, means and standard deviations. Analytic statistics used Chi square and Anova test, and p-value <0.05 was considered significant.

Results

TRUS evidence of CPV was found in 29 (14.2%) participants. For participants with TRUS evidence of CPV the demographic data and results of digital prostatic examination are represented in table one and the laboratory findings are represented in (Tables 1,2).

Of participants with TRUS evidence of CPV: Nine (31%) had low semen volume, 20 (69%) had normal semen volume, fourteen (48.3%) were AZ, 15 (51.7%) were OAZ, sixteen (55.2%) had increased pus cells in EPS (mean ± SD=59.1 ± 27.4/HPF, all had pus cells in EPS >20/HPF), 13 (44.8%) had normal pus cells count in EPS (mean ± SD=9.4 ± 5.5/HPF), twelve (41.4%) had increased pus cells in semen (mean ± SD=14.8 ± 10.8/HPF), 17 (58.6%) had normal pus cells count in semen (mean ± SD=3.4 ± 1.5/HPF), 8 (27.6%) had increased seminal fructose (mean ± SD=108.7 ± 30.6 mg%) and 21 (72.4%) had normal seminal fructose (mean ± SD=220.8 ± 56.3mg%).

TRUS evidence of CPV is represented in Table (3).

All participants with clinical and/or laboratory evidence of CPV had TRUS evidence of CPV. Comparative study among groups for the incidence of increased pus cells in EPS and/or semen showed insignificant difference.
Table (1): Numbers, percentages and age ranges (means) of participants with TRUS evidence of prostatovesiculitis in each group and the group total number. Number of participants with signs of prostatovesiculitis on digital prostatic examination in each group is represented in the last column.

<table>
<thead>
<tr>
<th>N of CPV and %</th>
<th>Age range (mean)</th>
<th>GTN</th>
<th>Age range (mean)</th>
<th>CPV on DPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSV-AZ 6</td>
<td>30-52 (39)</td>
<td>37 (100%)</td>
<td>20-52 (31.9)</td>
<td>3</td>
</tr>
<tr>
<td>LSV-OAZ 3</td>
<td>24-43 (35.5)</td>
<td>22 (100%)</td>
<td>21-52 (31.5)</td>
<td>2</td>
</tr>
<tr>
<td>NSV-AZ 8</td>
<td>25-34 (30)</td>
<td>62 (100%)</td>
<td>22-53 (30)</td>
<td>3</td>
</tr>
<tr>
<td>NSV-OAZ 12</td>
<td>24-40 (37)</td>
<td>80 (100%)</td>
<td>19-49 (31)</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total number</strong></td>
<td><strong>29 (14.2%)</strong></td>
<td><strong>24-52 (34.9)</strong></td>
<td><strong>201 (100%)</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

LSV : Low Semen Volume.  
AZ : Azoospermia.  
OAZ : Oligo and/or Asthenozoospermia.  
NSV : Normal Semen Volume.  
CPV : Chronic Prostato-Vesiculitis.  
DPE : Digital Prostatic Examination.

Table (2): Laboratory data of participants in groups with TRUS evidence of chronic prostatovesiculitis.

<table>
<thead>
<tr>
<th>VS</th>
<th>SC</th>
<th>SM</th>
<th>PS</th>
<th>EPS</th>
<th>SF</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSV-AZ</td>
<td>0.8±0.4</td>
<td>0</td>
<td>0</td>
<td>12±12</td>
<td>30±24</td>
<td>5±3.5</td>
</tr>
<tr>
<td>LSV-OAZ</td>
<td>1.2±0.3</td>
<td>47±45</td>
<td>13±12</td>
<td>5.3±3.5</td>
<td>29±22</td>
<td>147±49</td>
</tr>
<tr>
<td>NSV-AZ</td>
<td>2.8±0.7</td>
<td>0</td>
<td>0</td>
<td>10±12</td>
<td>40.4±26.6</td>
<td>187±49</td>
</tr>
<tr>
<td>NSV-OAZ</td>
<td>2.8±0.4</td>
<td>10.6±11.5</td>
<td>22.5±13.6</td>
<td>7.1±8.6</td>
<td>42.7±41.9</td>
<td>217±69</td>
</tr>
</tbody>
</table>

LSV : Low Semen Volume.  
AZ : Azoospermia.  
OAZ : Oligo and/or Asthenozoospermia.  
NSV : Normal Semen Volume.  
SM : Sperm Motility.  
PS : Pus Cells/HPF in Semen.  
EPS : Pus Cells/HPF in Expressed Prostatic Secretion.  
SF : Seminal Fructose.  
DPE : Digital Prostatic Examination.

Table (3): TRUS evidence of chronic prostatovesiculitis in each group.

<table>
<thead>
<tr>
<th>Prostate</th>
<th>SV heterogenous echogenicity± calcification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heterogenous echogenicity</td>
<td>Calcifications</td>
</tr>
<tr>
<td>LSV, AZ</td>
<td>6</td>
</tr>
<tr>
<td>LSV, OAZ</td>
<td>3</td>
</tr>
<tr>
<td>NSV, AZ</td>
<td>8</td>
</tr>
<tr>
<td>NSV, OAZ</td>
<td>12</td>
</tr>
</tbody>
</table>

LSV : Low Semen Volume.  
AZ : Azoospermia.  
OAZ : Oligo and/or Asthenozoospermia.  
NSV : Normal Semen Volume.

**Discussion**

CPV may affect the secretory function of the prostate and seminal vesicles that can lead to low semen volume. However, Wei Huang et al., [21] reported higher semen volume in chronic prostatitis patients compared to the control subjects. So in this study we included low and normal semen volume infertile men.

In the current study the percentage of clinical and/or laboratory evidence of CPV among participants was comparable with previously published researches [22,23]. All participants with clinical and/or laboratory evidence of CPV had TRUS evidence of CPV confirming the accuracy of TRUS in the diagnosis of CPV. In the current study TRUS evidence of CPV was detected in 14.2% of participants. However, nearly half of them had normal pus cells in EPS and/or semen and nearly two thirds had normal seminal fructose. This confirmed the need for another tool to assist in the diagnosis of CPV and stressed on the importance of TRUS screening to detect evidence of CPV among infertile men.

The secretory dysfunction in infertile men with CPV can be the cause of their infertility. In this study seminal fructose, as a marker for the secretory functions, was low in 27.6% of participants with TRUS evidence of CPV. In these participants, clinical examination, normal testosterone level, negative post orgasmic urine analysis and TRUS excluded the possible causes of low seminal fructose other than a secretory dysfunction caused by CPV. This confirmed that CPV can cause secretory dysfunction in infertile men.

Comparative study among the included 4 groups showed insignificant difference regarding the incidence of increased pus cells in EPS and/or semen indicating that CPV is not linked to certain semen parameters. This confirmed the importance of TRUS screening of infertile men with normal or low semen volume for evidence of CPV. CPV has deleterious effects on semen parameters in the
form of decreased sperm concentration and/or decreased percentage of motile sperms and secretory dysfunction [10,11,21,24]. In the current study, azoospermia in participants with TRUS evidence of CPV can be explained on the basis of functional pathology and/or proximal obstruction accompanying the CPV.

During the reproductive age, the main causative organisms of CPV are commonly sexually transmitted, namely chlamydia and mycoplasma especially Ureaplasma urealyticum that cannot be grown on routine culture media. So in this study routine cultures were not done.

Ultrasonography is a useful tool for detection of male genital tract abnormalities (including CPV) among infertile men; however lack of standardization is an obstacle [16]. An ongoing multicenter study is being done by the European Academy of Andrology to define the ultrasonographic characteristics of male genital tract of healthy fertile men [16].

Conclusion: TRUS may have a role in the diagnosis of CPV in infertile men. TRUS evidence of CPV had comparable incidence in low and normal semen volume infertile men.

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Conflict of interest: None.

References


21- WEIHUA FU, ZHANSONG ZHOU, SHIJIAN LIU, QIANWEI LI, JIWEI YAO, WEIBING LI and JUNAN YAN: The Effect of Chronic Prostatitis/Chronic Pelvic Pain Syndrome (CP/CPPS) on Semen Parameters in Hu-
