The prevalence of seminal vesicle cysts in autosomal dominant polycystic kidney disease

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Abstract

Background. Autosomal dominant polycystic kidney disease (ADPKD) is a systemic hereditary disorder characterized by bilateral diffuse renal cysts. Extrarenal involvement is a well known manifestation of ADPKD. Data relating to the association between seminal vesicle cysts and ADPKD are limited. The aims of this study are to evaluate the frequency of seminal vesicle cysts in ADPKD and to assess the relationship between seminal vesicle cysts, with cysts in the liver and prostate, and creatininemia.

Methods. Forty five male patients (mean age 40 years, range 13–67) were included in the study. Each subject underwent a formal interview, physical examination; and abdominal and transrectal ultrasonography. Three patients were infertile, but one of the patients also had varicocele.

Results. Seminal vesicle cysts were present in 27 (60%) patients. Liver and prostate cysts were present in 19 (42%) and five (11%) patients, respectively. There was a positive correlation between seminal vesicle cysts, cysts in the liver, and serum creatinine concentrations.

Conclusion. Our conclusions are: (i) seminal vesicle cysts are not uncommon in ADPKD; (ii) ADPKD should be looked for in patients with seminal vesicle cysts, and (iii) the clinical significance of seminal vesicle cysts in ADPKD remains to be defined.

Key words: polycystic kidney disease; seminal vesicle cysts

Introduction

Autosomal dominant polycystic kidney disease (ADPKD) is a systemic hereditary disorder characterized by bilateral diffuse renal cysts. Extrarenal involvement is a well known manifestation of ADPKD [1,2]. The most common extrarenal manifestations are liver cysts and cardiovascular abnormalities [2,3]. Cysts in the pancreas, lung, spleen, oesophagus, ovary, testis, epididymis, thyroid, bladder, uterus, brain and seminal vesicle have also been described [2,3]. The prevalence of pancreatic cysts in ADPKD has been documented recently [4]. Pancreatic cysts were found in 10 of the 173 (5.9%) patients in that study, but the percentage increased to 9% when only patients >30 years old were considered. Although ovarian cysts have been defined in ADPKD, according to a recent study, the frequency of occurrence of ovarian cysts does not appear to be increased in women with ADPKD [5]. Data relating to the association between seminal vesicle cysts and ADPKD are limited [3,6–10]. The aims of this study are to evaluate the frequency of seminal vesicle cysts in ADPKD and to assess the relationship between seminal vesicle cysts, cysts in the liver and prostate, age of the patients and creatininemia.

Subjects and methods

Forty five male patients (mean age 40 years, range 13–67) and 46 male controls matched with age of the subjects (mean age 41 years, range 21–73), renal dysfunction and renal replacement therapy were included in the study. Each subject underwent a formal interview, physical examination, and abdominal and transrectal ultrasonography. Thirty patients had a family history and eight of the remaining 15 patients had liver cysts. All the patients had a family history and eight of the remaining 15 patients had liver cysts. All the patients <30 years old had a family history of cysts.

ADPKD was defined by the presence of bilateral renal cysts, totalling five or more in number, visualized by ultrasonography with the presence of a family history or extrarenal cysts. Additional ultrasonographic findings for the diagnosis of ADPKD were enlarged kidneys and increased echogenicity in areas adjacent to the cysts. Thirty patients had a family history and eight of the remaining 15 patients had liver cysts. All the patients <30 years old had a family history of cysts.

Seminal vesicle cysts were defined as discrete anechoic (simple cysts) or hypoechogenic (hypoechogenic cysts) areas > 5 mm in diameter [11]. The differential diagnosis of seminal vesicle cysts and dilatation of the seminal vesicles were made by the
presence of isolated anechoic and hypoechoic areas, normal appearance of the remaining parts and the absence of asymmetric or bilateral enlargement of the seminal vesicles [11]. Prostate cysts were defined as discrete anechoic areas with characteristics of thin-walled, well-defined, homogeneous and posterior acoustic enhancement. None of the patients had symptoms referable to the perineum or lower genitourinary tract at the time of ultrasonographic examination. Thirty-six of the patients were married, and 33 of these 36 patients had children. Three patients were infertile, but one patient also had varicocele. Semen analysis could not be done. Urogenital system abnormalities and any disease related to seminal vesicle cysts were not present in the patients. In order to measure the density of the cysts, computed tomography (CT) examination was carried out in two patients. Magnetic resonance imaging (MRI) was done in a patient with seminal vesicle cysts in order to describe magnetic resonance images.

The Mann–Whitney U test and \( \chi^2 \) test were used for statistical analysis, and a \( P \)-value <0.05 was accepted as significant.

**Results**

Seminal vesicle cysts were present in 27 (60%) of the 45 patients (Figures 1a–c and 2). The size of the seminal vesicle cysts varied between 6 and 30 mm. The number of seminal vesicle cysts varied between four and eight. Twenty of the 27 seminal vesicle cysts were simple cysts. Hypoechoic seminal vesicle cysts containing internal echoes were present in seven patients. CT and MRI also showed seminal vesicle cysts. The density value of cysts varied between 5 and 18 Hounsfield units on CT scans. None of the controls had seminal vesicle cysts. Liver and prostate cysts were present in 19 (42%) and five (11%) patients, respectively. The number of prostate cysts was between one and three, and the diameter of the cysts were 3–4 mm. One patient had a pancreatic cyst. The relationships between seminal vesicle cysts, cysts in the liver and prostate, age of the patients and serum creatinine concentrations are shown in Table 1. Although the mean age of the patients with seminal vesicle cysts was

<table>
<thead>
<tr>
<th>Patient characteristics</th>
<th>Seminal vesicle cysts present</th>
<th>Seminal vesicle cysts absent</th>
<th>( P )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients, ( n )</td>
<td>27</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Age of the patients, years( ^a )</td>
<td>41 ± 3.0</td>
<td>38 ± 3.5</td>
<td>0.41</td>
</tr>
<tr>
<td>Cysts in liver</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>15</td>
<td>4</td>
<td>0.03</td>
</tr>
<tr>
<td>Absent</td>
<td>12</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Cysts in prostate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>5</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>Absent</td>
<td>22</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Serum creatinine</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>( \geq 177 ) ( \mu )mol/l</td>
<td>14</td>
<td>2</td>
<td>0.005</td>
</tr>
<tr>
<td>(&lt; 177 ) ( \mu )mol/l</td>
<td>13</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

\( ^a \)Data are mean ± SEM.

![Fig. 1. Cysts in seminal vesicles in three patients on ultrasonography (USG) and computed tomography (CT) examinations. (a) Simple cyst, sagittal scan, transrectal USG (TRUS); (b) simple cysts, transabdominal USG; (c) cysts, axial CT scan.](image)
Seminal vesicle cysts in ADPKD

Discussion

Transrectal ultrasonography (TRUS) is helpful in the diagnosis of seminal vesicle cysts and it also reveals information about the cyst, e.g. its location, size and shape, and relationships and integrity of seminal vesicles [12–14]. TRUS is non-invasive as compared with vasography, and is more readily available and economical than other means, such as CT and MRI. By TRUS, the differential diagnosis of seminal vesicle cysts should include dilated seminal vesicles. The dimensions of the seminal vesicles increase without any isolated cysts in the dilated seminal vesicles. The TRUS findings of dilatation of the seminal cysts are asymmetric or bilateral enlargement >1.5 cm in the anteroposterior dimension [11]. Seminal vesicle cysts appear as isolated cysts, and the remaining parts of the seminal vesicles must be normal on TRUS, as was the case in our patients. CT and MRI results support this finding in our study (Figures 1c and 2). Seminal vesicle cysts may be filled with liquid or semi-solid material as for renal cysts [3,15]. Simple cysts are filled with liquid material, and sonographic findings are anechoic cysts with a well-demarcated, thin wall and posterior acoustic enhancement (Figure 2a and b). Hypoechoic seminal vesicle cysts containing internal echoes were present in seven patients by TRUS, and these features may be related to semi-solid material. We did not evaluate the material within the cysts by aspiration and further studies are required to reach a definite conclusion.

Cystic disease of the seminal vesicles can be congenital or acquired [16–18]. Congenital seminal vesicle cysts have been described in association with urogenital system abnormalities such as renal agenesis or dysgenesis, ectopic ureteral insertions and vas deferens agenesis. Acquired seminal vesicle cysts have been found in benign prostate hypertrophy, chronic infection, scarring of the seminal vesicle, and after prostatic surgery [3]. Urogenital system abnormalities associated with congenital seminal vesicle cysts and any disease related to acquired seminal vesicle cysts were not present in our patients. The only disease associated with seminal vesicle cysts was ADPKD in our patients. The clinical significance of seminal vesicle cysts in ADPKD has not been clearly defined. Clinical findings related to seminal vesicle cysts were present in three patients in previous studies; one patient had haemospermia and two patients had infertility. Could seminal vesicle cysts lead to infertility? The cause of infertility may be obstruction due to seminal vesicle cysts, probably through compression of the ductal system. Infertility was present in only our three patients, but one of these patients also had varicocele. A detailed investigation of fertility was not carried out in our study. Although the small number of patients with infertility does not allow us to conclude that seminal vesicle cysts cause infertility, it is an interesting finding. Uraemia may also lead to infertility [19], and seminal vesicle cysts may be an additional cause of infertility in patients with ADPKD. Studies evaluating fertility in patients with seminal vesicle cysts and ADPKD are needed.
Liver involvement is the most common extrarenal manifestation of ADPKD, and liver cysts are present in 38–75% of these patients [1,2,15,20]. Liver cysts were present in 19 of the 45 (42%) patients in our study. Seminal vesicle cysts were more common than liver cysts in our study, and this is a new and interesting finding, because according to our knowledge and to the Medline facilities of our university, there have been reports of only 10 patients with seminal vesicle cysts and ADPKD in the literature (Table 2). As far as we know, the frequency of seminal vesicle cysts and the relationship between seminal vesicle cysts, cysts in liver and prostate, age of the patients and creatininemia have not been studied previously in ADPKD. Liver cysts often appear 10–20 years later than renal cysts and correlate with renal dysfunction. The correlation between seminal vesicle cysts, liver cysts and creatininemia indicates that seminal vesicle cysts develop later in life. The absence of seminal vesicle cysts in a patient without renal cysts in family screening supports this thesis. However, we could not show a relationship between the presence of seminal vesicle cysts and the age of the patients. More studies are needed to clarify this subject.

Our conclusions are: (i) seminal vesicle cysts are not uncommon in ADPKD; (ii) ADPKD should be looked for in patients with seminal vesicle cysts; and (iii) studies evaluating fertility in patients with seminal vesicle cysts and ADPKD are needed.

References


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