Letter to the editor

Daisy-like crystals: Not just the result of sampling artifact and not only in urine

In a recent issue of this journal, Hudák and co-workers reported on daisy-like crystals (DLcr) found in the urine of a 5-year-old female child, collected in a glass jar which had been sterilized by using tap water boiled for 15 min and left to cool overnight [1]. The same crystals were also found in two samples containing only hard water, again boiled and then cooled: one collected by the patient’s family at laboratory request, the other collected under experimental conditions in the laboratory. These findings led the authors to hypothesize that DLcr previously described by us [2,3] and by Frochot and co-workers [4] could be the result of urine contamination due to urine collected in containers sterilized at home by using boiled water with a high limescale content.

In order to verify the hypothesis proposed by Hudák and co-workers, we have retraced the urine collection procedures used by the subjects described so far [2-4] by contacting the laboratory professionals who had found DLcr in their urine. The results, reported in Table 1, demonstrate that 9 out of 11 subjects had used appropriate sterile plastic containers (tubes or jars), either bought in pharmacy or supplied by laboratories, while for 2 other subjects no information could be retrieved (Table 1: patient 4 did not remember how she had collected the urine in October 2011; patient 8, a 93-year-old woman in 2016, could not be reached).

As to the urine of the dog containing DLcr [3], we now know from one of us (J.K.) that it had been collected in a non-sterile plastic container, which had been cleaned with warm water and soap [5]. Thus, for that case we cannot exclude that DLcr might have been caused by urine contamination from water. However, after that case, small amounts of DLcr have been found in the urine of two other dogs, in one of which urine had been obtained by direct bladder puncture and in the other by bladder catheter. In both cases the urine had been collected in a sterile plastic syringe and examined with manual microscopy [5].

Table 1

<table>
<thead>
<tr>
<th>Subject</th>
<th>Gender/Age (years)</th>
<th>Date/Country</th>
<th>Source</th>
<th>Urine collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1*</td>
<td>Female/30</td>
<td>March 2003/Italy</td>
<td>Silvia Baroni</td>
<td>Sterile plastic jar</td>
</tr>
<tr>
<td>2**</td>
<td>Female/40</td>
<td>August 2006/Croatia</td>
<td>Dunja Rogic</td>
<td>Sterile plastic tube</td>
</tr>
<tr>
<td>3**</td>
<td>Female/3</td>
<td>April 2003/Italy</td>
<td>Carla Covarelli</td>
<td>Sterile plastic tube</td>
</tr>
<tr>
<td>4**</td>
<td>Female/38</td>
<td>October 2011/Italy</td>
<td>Roberta Anderlini</td>
<td>Not available</td>
</tr>
<tr>
<td>5**</td>
<td>Male/19</td>
<td>March 2014/Belgium</td>
<td>Jeremie Gras</td>
<td>Sterile plastic jar</td>
</tr>
<tr>
<td>6**</td>
<td>Female/77</td>
<td>February 2015/Italy</td>
<td>Roberta Anderlini</td>
<td>Sterile plastic tube</td>
</tr>
<tr>
<td>7**</td>
<td>Female/78</td>
<td>September 2015/Italy</td>
<td>Alexandre Teboul</td>
<td>Sterile plastic tube</td>
</tr>
<tr>
<td>8**</td>
<td>Female/93</td>
<td>May 2016/Italy</td>
<td>Roberta Anderlini</td>
<td>Not available</td>
</tr>
<tr>
<td>9**</td>
<td>Female/47</td>
<td>December 2016/Italy</td>
<td>Antonietta Proietti</td>
<td>Sterile plastic tube</td>
</tr>
<tr>
<td>10**</td>
<td>Female/82</td>
<td>January 2017/Italy</td>
<td>Simone Canovi</td>
<td>Sterile plastic tube</td>
</tr>
<tr>
<td>11½</td>
<td>Female/64</td>
<td>July 2016/Belgium</td>
<td>Vincent Castiglione</td>
<td>Sterile plastic jar</td>
</tr>
</tbody>
</table>

As to the urine of the dog containing DLcr [3], we now know from one of us (J.K.) that it had been collected in a non-sterile plastic container, which had been cleaned with warm water and soap [5]. Thus, for that case we cannot exclude that DLcr might have been caused by urine contamination from water. However, after that case, small amounts of DLcr have been found in the urine of two other dogs, in one of which urine had been obtained by direct bladder puncture and in the other by bladder catheter. In both cases the urine had been collected in a sterile plastic syringe and examined with manual microscopy [5].

Last but not least, DLcr have been found by one of us (S.B.) in the seminal fluid of two male patients who had been investigated for infertility. For both patients the sperm had been collected, after few days of sexual abstinence, in a plastic sterile jar and was examined by manual microscopy at 400× magnification one hour after ejaculation [6]. Patient 1 was a 21-year-old man, whose sperm, examined on February 10th 2010, contained 9 DLcr/10¹⁶ µL; patient 2 was a 37-year-old man whose sperm, examined on December 12th, 2019, contained 4 DLcr/10¹⁶ µL.

In conclusion, if on one hand the paper of Hudák and co-workers demonstrate that DLcr in the urine can be due to a sampling artifact, on the other our data clearly demonstrate that other factors, not associated with urine collection procedures, can favour the precipitation of DLcr in urine. All this highlights the importance of using proper sterilized urine containers. Finally, we now know that DLcr can also be found in seminal fluid, besides in the parotid saliva of dogs as reported by Charles-Philippe Robin and François Verdel in 1853 [7].

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References


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Letter to the editor

Silvia Baroni
UOC Chimica Biochimica e Biologia Molecolare Clinica, Fondazione Policlinico Universitario Agostino Gemelli IRCCS, Università Cattolica del Sacro Cuore, Roma, Italy

Jaroslav Kucera
Veterinary Clinic Pet, Brno, Czech Republic

Roberta Anderlini
CoreLab, Dipartimento Interaziendale ad attività integrata Medicina di Laboratorio, NOCSAE, Modena, Italy

Simone Canovi
Laboratorio Analisi Chimico-Cliniche e di Endocrinologia, Azienda USL-IRCCS di Reggio Emilia, Reggio Emilia, Italy

Vincent Castiglione
Department of Clinical Chemistry, University of Liège, CHU Sart-Tilman, 4000 Liège, Belgium

Carla Covarelli
Struttura Complessa di Anatomia e Istologia Patologica, Azienda Ospedaliera S. Maria della Misericordia, Perugia, Italy

Vincent Frochot
AP-HP, Hôpital Tenon, Service d’explorations fonctionnelles multidisciplinaires, Paris 6, France

Jérémie Gras
Institute for Pathology and Genetics, Gosselies, Belgium

Antonella Proietti
Laboratorio Analisi di Foligno, USL Umbria 2, Foligno, Italy

Dunja Rogic
Clinical Institute of Laboratory Diagnostics, University Hospital Zagreb, Zagreb, Croatia

Alexandre Teboul
Laboratoire A. et R. Teboul, Sucy en Brie, France

Giuseppe Garigali, Giovanni B. Fogazzi*
Laboratorio Clinico e di Ricerca sul Sedimento Urinario, UOC di Nefrologia, Dialisi e Trapianto di Rene, Fondazione IRCCS Ca’ Granda Ospedale Maggiore Policlinico, Milano, Italy

* Corresponding author at: Clinical and Research Laboratory on Urinary Sediment, UOC di Nefrologia, Dialisi e Trapianto di Rene, Fondazione IRCCS, Ca’ Granda Ospedale Maggiore Policlinico, Via della Commenda, 15, 20122 Milan, Italy.
E-mail address: giovanni.fogazzi@policlinico.mi.it (G.B. Fogazzi).