Electronic monitoring to diagnose and treat drug nonadherence

Arnaud Chioleoa,b and Valérie Santschic,d

Hamdidouche et al. [1] elegantly summarized recent findings about drug adherence in hypertension, with the goal of helping clinicians and researchers to address the problem more efficiently. The authors listed strengths and limitations of ‘indirect’ methods to measure drug adherence, including clinical estimation and patient questionnaires, pill counting, prescription refill, and electronic monitoring. The later method uses an electronic pillbox that records each time the cap is opened. The authors argue that such monitoring can provide a timing of drug intake but that it is unable to certify the ingestion of correct dose, as opening the box does not mean that the pill was ingested [1]. Although this limitation is well known, several advantages and new technological developments of electronic monitoring have been however overlooked.

Electronic monitoring has been advocated as early as 1989 by Cramer et al. [2] to quantify reliably ambulatory patient’s drug adherence. Initially, this tool consisted of a pill bottle with a microprocessor in the cap that records dates and times of each opening, with one opening corresponding to one presumptive dose drug taken. Other electronic drug reminder devices and web applications recently developed have largely expanded possibilities of electronic monitoring of adherence. Compared to other indirect methods, electronic monitoring provides a dynamic, and real time – day-to-day – measure of patient’s drug intake and omissions [2,3]. This is of major importance because adherence is not a fixed feature of patients but a dynamic process: the degree of adherence changes according to treatment regimen, patients’ perceptions of the disease and its treatment, or external influences such as traveling or holidays [3].

The key role is that electronic monitoring is unique to take rational treatment decisions [4]. Indeed, if a patient treated for a condition such as hypertension is not controlled, the physician assumes, most often, the inefficiency of the treatment and changes it. If adherence is not optimal, changing medications will not improve blood pressure control. Unless the patient recognizes being not adherent, physicians cannot differentiate treatment failure because of inadequate treatment or nonadherence. Further, electronic monitoring makes it possible not only to diagnose poor adherence but also to treat it. Several studies suggest, indeed, that it helps control chronic conditions such as hypertension [1,4]. For instance, in a pragmatic randomized controlled study conducted in a community of pharmacist and physicians’ networks, hypertensive patients allocated to electronic monitoring achieved a better blood pressure control [4].

Nevertheless, we agree that electronic monitoring, using pillboxes or other tools allowing real-time adherence, is not sufficient per se to treat nonadherence in patients with chronic conditions. A comprehensive and personalized approach, involving several strategies, is critical to improve drug adherence [1,5]. In our opinion, adherence should be addressed within novel approaches of care of chronic conditions [6]. With the development of collaborative care model including different healthcare professionals (physicians, nurses, pharmacists) [7], the increasing implication of the patient, and the development of ehealth technologies, intervening to diagnose and treat poor adherence is becoming truly possible.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

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Who is an expert?

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I would like to question the critical comments by Messerli et al. [1] entitled ‘Expertise: no longer a sine qua non for guideline authors’, in which they question the credibility of the authors of the recently published ‘Clinical Practice Guideline from the American College of Physicians and the American Academy of Family Physicians pertaining to Pharmacologic Treatment of Hypertension in Adults Aged 60 Years or Older’ (ACP/AAFP) [2].

The issue raised is simply this: Do the authors qualify as experts? To demonstrate that they did not fulfill the commonly held criteria by which experts may be defined, Messerli et al. selected as their gold standard the experts who authored the ‘Evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8)’ [3].

On the face of it, the data presented in the table make a damning case against the authors of the ACP/AAFP guideline (Table 1). Indeed, the authors extol the virtues of the JNC 8 experts in glowing terms: ‘When one scrutinizes the

### TABLE 1. Comparison of publications, Society of Hypertension certification and membership, and editorial board membership (as per 01/2017)

<table>
<thead>
<tr>
<th>Publication</th>
<th>No. of publications on hypertension</th>
<th>Society certified specialist</th>
<th>Society membership</th>
<th>Editorial board membership</th>
</tr>
</thead>
<tbody>
<tr>
<td>JNC 8 no. of authors = 17</td>
<td>39 (55.1–121)</td>
<td>8</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>ACP/AAFP no. of authors = 6</td>
<td>0.5 (0–2.5)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Associated members ACP/AAFP no. = 28</td>
<td>0 (0–0.75)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2013 ESC/ESH no. of authors = 25</td>
<td>98 (40.5–197)</td>
<td>17</td>
<td>18</td>
<td>23</td>
</tr>
</tbody>
</table>

*Median (interquartile range).


1American Society of Hypertension (ASH) and European Society of Hypertension (ESH), respectively.