

# The Review

## Fatalities after CAM:

an overview

Many practitioners of complementary and alternative medicine (CAM) and most patients seem to believe that CAM is almost totally devoid of risks. Critical observers, however, should know better. There are numerous risks and some of them can be serious.

In this overview, I very briefly summarise reports of fatalities that have occurred after acupuncture, EDTA-chelation therapy, and chiropractic. This article is based on three recently published systematic reviews.<sup>1-3</sup> It is aimed at highlighting the rare but potentially serious nature of adverse events after CAM.

### ACUPUNCTURE

A systematic review included 86 instances of deaths after acupuncture.<sup>1</sup> Many of the primary reports were incomplete, and causality was often less than certain. The most frequent causes of death were pneumothorax; puncture of the heart, large blood vessel, central nervous system, or liver; and various types of (mostly bacterial) infections. The majority of the reports originated from China, Japan and other Asian countries. Others came from Germany, Norway, and the US.

### CHELATION THERAPY

In CAM EDTA-chelation therapy is sometimes advocated for cardiovascular diseases such as *claudicatio intermittens*. A systematic review summarised all deaths after EDTA-chelation therapy reported since 1990.<sup>2</sup> Nine fatalities were found. Again, the quality of reporting was frequently poor. Thus causality was, in some cases, not clear. The causes of death included myocardial infarction, cardiac arrest, arrhythmia, and others.

### CHIROPRACTIC

The aim of a further systematic review was to summarise all cases in which chiropractic treatment was followed by death.<sup>3</sup> Twenty-six published case reports were included. In addition, several fatalities were found which had not been formally

published in the medical literature. The alleged pathology was usually a vascular accident involving the dissection of a vertebral artery after upper spinal manipulation.

### COMMENT

In total, over 100 deaths were associated with acupuncture, chelation therapy, and chiropractic. More fatalities are associated with acupuncture than with the other treatments. This could be a reflection of the high prevalence of this treatment. Pneumothorax was the most frequent adverse effect associated with death. It also is the most frequent of all serious, non-fatal complications of acupuncture.<sup>4</sup> All deaths, it seems, would have been avoidable with proper acupuncture technique and sufficient anatomical knowledge. Thus, this is a stark reminder of the challenge to train all acupuncturists to a sufficiently high level of competency.

Non-fatal adverse effects of EDTA-chelation are numerous,<sup>5,6</sup> and continue to be reported with some regularity.<sup>7-10</sup> Some chelationists claim that fatalities reported before 1900 were mostly due to excessive doses.<sup>11</sup> The data summarised above do not allow firm conclusion as to whether the improved protocol, introduced in the 1990s, is indeed safer. 'Alternative' chelation therapy (that is, its use for arteriosclerotic and other conditions proposed by some CAM practitioners rather than its conventional use for severe heavy metal poisoning) is biologically implausible, not demonstrably effective, and associated with serious adverse effects.<sup>12</sup> Thus, we should question its clinical value: its benefits do not seem to outweigh its risks. Therefore chelation cannot be recommended as an alternative means of treating arteriosclerotic diseases.

Vascular accidents after upper spinal manipulation are a well-recognised problem.<sup>13,14</sup> Dissection of a vertebral artery, caused by high-velocity, short-lever thrusts involving extension and rotation of the neck beyond the physiological range, is

thought to lead to a chain of events including arterial dissection, thrombosis, stroke, and death.<sup>13-16</sup> The fatalities reported in the medical literature are likely to be only the tip of a much larger iceberg. In a survey of UK neurologists, under-reporting of vascular accidents was 100%.<sup>17</sup> Many of the published instances are incomplete. Of 40 published case reports of serious adverse effects associated with spinal manipulation, nine failed to provide any information about the clinical outcome.<sup>18</sup> Incomplete reporting of outcomes might therefore further increase the true number of fatalities. Considering the implausibility of the basic assumptions of chiropractic,<sup>19</sup> its lack of efficacy for many conditions,<sup>20</sup> and its risks, it is hard to find good reasons for recommending this treatment.

Essentially, this overview shows that acupuncture, chelation, and chiropractic have been associated with severe complications including numerous deaths. No rigorous systems for reporting adverse effects of these treatments currently exist, and under-reporting is likely to be considerable. One should therefore consider implementing adverse effects monitoring schemes that would eventually inform us reliably about the true size of the problem.

Acupuncture, chelation, and chiropractic are merely examples of a large range of therapies used in CAM, most of which have also been associated with severe complications and deaths. Examples include herbal medicine,<sup>21</sup> oxygen-ozone therapy,<sup>22</sup> massage,<sup>23</sup> osteopathy,<sup>24</sup> alternative dietary regimen,<sup>25</sup> vitamin supplements,<sup>26</sup> aromatherapy,<sup>27</sup> homeopathic remedies,<sup>28</sup> hypnotherapy,<sup>29</sup> meditation,<sup>30</sup> and yoga.<sup>31</sup> Perhaps more importantly, there are indirect risks of CAM to consider.<sup>32</sup> Examples include questionable advice by CAM practitioners over the internet,<sup>33</sup> irresponsible sales techniques,<sup>34,35</sup> replacement of effective treatments by ineffective alternatives,<sup>36</sup> or delay of effective therapies.<sup>37</sup>

The relative frequency of fatalities after CAM is unknown. Many proponents of CAM would argue that the deaths reviewed here are extreme rarities and that these treatments are still much safer than many mainstream interventions. This may be true, but it also misses an important point:

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*'There are numerous risks and some of them can be serious.'*

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## ADDRESS FOR CORRESPONDENCE

### Edzard Ernst

Complementary Medicine, Peninsula Medical School, University of Exeter,  
25 Victoria Park Road, Exeter EX2 4NT, UK.

**E-mail:** Edzard.Ernst@pms.ac.uk

therapeutic risks should never be viewed in isolation but in relation to therapeutic benefits. If the benefit is small, uncertain, or non-existent, even relatively minor risks would render a risk-benefit analysis negative.

In conclusion, acupuncture, chelation, and chiropractic have been associated with a number of deaths. We should consider monitoring the risks more systematically.

### Edzard Ernst,

Professor of Complementary Medicine, Peninsula Medical School, University of Exeter, Exeter.

### Provenance

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