

tion of symptoms, which was not statistically significant.<sup>10,13,15,16,20</sup> Only in the remaining five trials did the authors report a reduction in the duration of colds that was significant. There is thus a little more evidence for a small therapeutic effect of ascorbic acid, but it is not clear which symptom it relieves or how.

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*To the Editor:* Dr. Levine's review sits on the fence in the matter of ascorbic acid and common colds. He cites four references, only two of which are primary sources.<sup>1,2</sup> A search of the literature reveals at least 27 controlled trials of ascorbic acid for colds.<sup>1-27</sup> The majority (22 trials) tested for prevention and also for any ameliorating effect of maintenance doses. A therapeutic effect was tested for in only five trials.<sup>17-21</sup>

It is by now fairly clear that for preventing common colds, vitamin C has no worthwhile effect. There was no significant advantage over placebo in 15 trials,<sup>1,3-16</sup> all but 1 double-blind.<sup>3</sup> These were performed in a total of 9169 subjects in various settings in six countries. By contrast, seven trials<sup>2,22-27</sup> in a total of 3209 subjects reported some beneficial effect. But one trial was small<sup>25</sup> and not well designed<sup>9</sup>; in another<sup>26</sup> a preventive effect was observed only in girls, not boys.<sup>28</sup> The authors of another three trials thought the preventive effect unimpressive.<sup>2,22,26</sup> Two went on to repeat trials with ascorbic acid and obtained negative results.<sup>1,17</sup> The only striking reduction in the number of colds was reported by Ritzel.<sup>23</sup> More ink has been used in the criticism of this trial<sup>29,30</sup> than in the original description. The subjects took ascorbic acid for only one or two weeks. This is not long enough for a trial of prevention; saturation of tissues with ascorbate takes several days.

As for a therapeutic effect, all five randomized double-blind trials designed to test this, without a combined trial for prophylaxis, had negative results.<sup>17-21</sup> Most of the trials that tested for a prophylactic effect also looked for amelioration of the duration or severity of colds in subjects given maintenance doses of vitamin C (in three trials<sup>8,10,27</sup> the subjects took extra tablets if symptoms appeared). In eight of these combined trials there was no reduction in duration or severity with ascorbic acid as compared with placebo.<sup>1,3,4,8,9,11,14,22</sup> In another five combined trials there appeared to be slight ameliora-

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