

Thirteen follies and fallacies about alternative medicine

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The use of alternative medicine (AM)—treatments such as herbs or massage therapy—has long been a part of healthcare in many regions of the world “to complement mainstream medicine by contributing to a common whole, by satisfying a demand not met by orthodoxy or by diversifying the conceptual frameworks of medicine” [1]. What AM cannot do is replace conventional treatment, particularly when it comes to serious or even life-threatening conditions. Nevertheless, many AM apologists insist that it can do so, that it is an alternative rather than a complement. This assumption can confuse patients and even endanger their lives. In this Opinion article, I explore some of the most common fallacies used to support, justify or promote AM.

1. Since many people believe in or practise AM, it is tempting to assume that it is useful. According to this *argumentum ad populum*, millions cannot all be wrong. However, belief can be wrong, practice can be misguided, and popularity is not a reliable indicator for effectiveness; after all, medicine is no popularity contest. The history of medicine is littered with examples that demonstrate how misleading this fallacy can be. Bloodletting was believed to be effective, was widely practised and highly popular, yet it certainly killed more patients than it ever helped.

2. The classic *post hoc, ergo propter hoc* fallacy—‘it worked for me (my aunt, my cat etc)’—is firmly engrained into the human mind. If a patient receives a treatment and then gets better, what could be more logical than to assume that the treatment was the cause of the improvement? This conclusion seems as obvious to patients—and many clinicians—as it is fallacious. Proponents of AM employ this fallacy incessantly to

convince us that ineffective treatments are, in fact, effective.

Apart from the treatment *per se*, a whole range of phenomena exists that can cause or contribute to improvement: the placebo effect, the natural history of the illness, the regression towards the mean and so on. It means that patients can get better after administering useless or even mildly harmful remedies; subsequently is not the same as consequently. Causal inferences based on anecdotes are therefore highly problematic and certainly no sound basis for robust conclusions about the efficacy of therapeutic interventions.

Most apologists for AM argue that it is of secondary importance how a given type of AM works. Even if it were a pure placebo, they say, it would still help suffering patients through a placebo response, and surely that must be a good thing. In other words, the mechanism of the effect is of little practical relevance and what counts most is to help the patient.

This fallacy ignores several important issues. The administration of placebos in clinical routine can be unethical and dangerous, but is also not necessary to produce a placebo response. If a clinician administers an effective therapy with empathy and compassion, he or she generates a placebo effect in addition to the specific therapeutic effect. Exclusively relying on placebos therefore deprives the patient of the latter.

3. Apologists for AM like to cite statistics that show how a sizeable percentage of all conventional treatments is not supported by sound evidence. Thus, they argue, it is unfair to insist on AM being solidly evidence-based. Unquestionably, many conventional therapies are currently not evidence-based. Yet, this is hardly a reasonable justification for using unproven or disproven forms

of AM. Unreliable railways do not get more acceptable because thousands of people get stuck in traffic jams on the roads.

4. The adverse effects of conventional medicine are argued to be so serious and frequent that those of AM are negligible. While it is true that the risks of some conventional treatments are greater than those of some forms of AM, this is beside the point. The real value of a treatment is not determined by its absolute risk but by the balance between risk and benefit. If a treatment is potentially life-saving, substantial risks can be tolerated. If a therapy has no benefit, even a small risk would weigh heavily and the risk–benefit balance would not be positive.

5. Whenever scientific investigations fail to show what they had hoped for, apologists for AM claim that science cannot be meaningfully applied to their field. Their type of AM, they insist, is holistic, individualized, complex, relies on subtle, unquantifiable energies and so on, and these circumstances prevent it from being squeezed into the straight jacket of reductionist science. After all, there are many things “between heaven and earth” that science will never be able to capture.

Science certainly has its limits. Yet, when it comes to testing therapeutic claims, it provides us with fairly adequate tools to assess them. Even if the claim is that a particular holistic, individualised and complex form of energy healing makes you feel better, live longer or experience life more wholesomely, the hypothesis is scientifically testable. Even if no validated outcome measure exists for a particular claim, scientists should be able to develop one. The notion that “a therapy defies scientific testing” merely discloses a lack of understanding of what science can achieve.

6. Most people would probably agree that many AM practitioners are well intentioned. There is also evidence that they are capable of building up a good therapeutic relationship with their patients [3]. To extrapolate from such data that AM is useful would, however, be erroneous. Compassion, empathy and good interactions with patients are certainly important, but they are not a monopoly of AM. In fact, these qualities are among the hallmarks of any good healthcare. To imply that only AM practitioners possess them is wrong and an insult to the many clinicians who are doing their best to implement patient-centred care, often under difficult circumstances.

7. Many forms of AM are said to have long histories that must surely count for something; any treatment that has stood the test of time must be useful. Some practitioners of AM even insist that the “test of time” is more relevant than that of science. A long tradition of use can, of course, be an indicator of the safety and efficacy of a treatment, but it can never be proof. On the contrary, a long history might just indicate that the origins of that therapy reach back to a time when anatomy and physiology, among other things, were not well understood. This, in turn, might lessen the chances that any such intervention is plausible or effective. Treatments such as bloodletting or purging again provide apt examples.

8. Enthusiasts of AM tend to appeal to authority in various ways. They may state that a government organization endorses particular modalities, that respectable pharmacies sell AM preparations, that the royal family uses them, that Nobel-prize winners support them and so on. These claims may well be true, but to infer that such endorsements render AM valuable would be fallacious. Endorsements of this kind might merely show that even well-educated, authoritative people or institutions can sometimes commit silly mistakes.

9. An entire industry has developed around the notion that AM is natural and therefore cannot do any harm. The implication is that conventional treatments are based on unnatural chemicals, which are potentially harmful. Nature, by contrast, is benign and natural remedies are to be preferred. This argument is as effective for marketing purposes as it is fallacious. Firstly, by no means are all forms of AM natural. For instance, there is nothing natural in sticking

needles into a patient's body (as in acupuncture) or endlessly diluting and shaking a medicine (as in homeopathy). Secondly, Nature is not necessarily benign. Even herbal extracts from natural sources are not necessarily safe [2]—think of hemlock.

10. Many AM enthusiasts seem to believe that powerful intrigues aim at suppressing the knowledge of AM about how to heal the sick. The pharmaceutical industry is often cited in this context. The underlying assumption is that the pharmaceutical sector would lose substantial amounts of revenue if the true value of this or that form of AM became general knowledge. I have never seen any evidence to suggest that this notion is true or that those who make such claims can produce good evidence for it. In my experience, the pharmaceutical industry is barely aware of AM or, when it is, it has found ways of profiting from it by marketing ‘natural’ supplements.

11. If ‘big pharma’ is not in the frame, other institutions or professionals might be. Oncologists, for instance, are said to disregard and suppress alternative methods claimed to be cancer cures. Yet I have never met a single oncologist who would not be delighted to see an effective cancer cure emerge or who would care one iota whether it originates from the field of AM or from any other source.

12. Absence of evidence is not evidence of absence of effect. If, for a given form of AM, we have no or no good evidence for its effectiveness, we cannot assume that it is ineffective. The principle is, of course, entirely correct. We have not identified life on other planets, for instance, but we cannot be sure that no extraterrestrial life exists. However, the conclusion some AM apologists draw from this principle is grossly misleading. They argue that it is reasonable to use the treatment in question until evidence emerges that proves it to be ineffective. In healthcare, it is unwise and arguably unethical to give the benefit of the doubt to under-researched therapies. In the interest of our patients, we should use treatments that are supported by sound evidence for effectiveness, while those that do not fall into this category should be avoided.

13. AM is dominated by strong beliefs rather than sound evidence. Thus, it is perhaps unsurprising that some believers resort to *ad hominem* attacks, particularly when they have run out of rational arguments

against their critics. During the past 20 years of researching AM, I have received my fair share of such personal attacks that attempt to undermine my authority and integrity. For instance, it has been claimed that I am not qualified to do the work that I do, that I am guilty of scientific misconduct, that I am on the payroll of ‘big pharma’, or that I have personal reasons to be biased. The aim of *ad hominem* attacks is to discredit an opponent and, for some fanatic believers, this aim seems to justify even the most drastic means.

AM is plagued by fallacies that confuse or mislead the public and thus prevent many patients from making the right therapeutic decisions. A good example is the attitude of many AM apologists regarding immunization [2]. They tend to combine several of the above-listed fallacies into a series of grossly misleading arguments: vaccinations are not as effective as they are made out to be, and infection rates actually declined because of better hygiene; vaccinations frequently cause serious problems, such as autism; famous and intelligent people have refused to vaccinate their children; vaccinations are unnatural, while the alternative options are natural and safe; vaccinations are pushed by ‘big pharma’ to enrich their shareholders; just because there is no evidence for the alternatives, this does not mean they are not effective; and the experts who speak out in favour of vaccinations are corrupt.

This example highlights the fact that much harm can be done by falling for the plethora of fallacies that dominate the field of AM. It is therefore important to discuss these arguments openly and disclose them for what they truly are: often seemingly plausible notions that are actually misleading to the point of endangering public health.

CONFLICT OF INTEREST

The author declares that he has no conflict of interest.

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