

Evidence Based Prejudice

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It can sometimes seem like there are two competing ways to make a decision about any complex matter of evidence based medicine. One is to purchase and digest “How To Read A Paper” by Professor Trisha Greenhalgh (BMA Books, a life changing experience if you have a week to spare), and then find, read, and critically appraise every single published academic study independently and in full for yourself. The other more common method is to rely on “experts”, or what I like to call “prejudice”.

But there is a third way: what we might call “Evidence Based Prejudice”. I can’t possibly debunk every single alternative therapy column you will ever read: but if I could show that their single most popular claim has no foundation, then you could safely ignore everything else they say, thus saving valuable brain energy, and freeing up extra time for you to write best-selling novels and eradicate world poverty.

And so to antioxidants. The basic claim of the alternative therapy industry is as follows: free radicals in the body are bad, but antioxidants neutralize free radicals; people who eat vegetables with antioxidants in them live longer, therefore antioxidant tablets are good.

Now this “free-radicals-bad antioxidants-good” morality tale looks great on paper: but if you’re going to read a biochemistry textbook and pull bits out at random, you can prove anything you like. For example, my phagocytic cells build a wall around invading pathogens and then use free radicals – amongst other things - to kill the bacteria off, before the bacteria kill me. They’re probably doing it right now, somewhere in here. So do I need free radical supplements to help me fight infections? Sounds plausible. You can see, now, how I could make some serious money if I ever turned to the dark side (alternative therapists, why not just pick some more chemicals at random from this [bad boy](#)).

Of course the “antioxidants good” story didn’t come entirely out of the blue: it came, like almost all the evidence on diet and health, from observational studies. People who eat well, with plenty of fruit and vegetables in their diet, tend to live longer, healthier lives. But these are observational studies, not intervention studies. These are not studies where you take a few thousand people and make them eat salad. These are surveys, looking at people who already have healthy diets: people like me, and since you’re asking, I also cycle to work, get a good night’s sleep, have a fairly comfortable lifestyle, a stable relationship, and a plausible career. People like me do live longer (thanks for asking) but it’s not just the antioxidants in our rocket salad.

So what happens, then, when people do big studies, forcing people to eat salad? Well it's not an easy thing to do, if only because it's difficult to get people to eat what you tell them, and measure what they eat, and check if they're truthful, and so on: the [Multiple Risk Factor Intervention Trial](#) in the 1970s was probably the single biggest medical project ever undertaken, it took 12,866 men, advised them, monitored them, cajoled them, persuaded them, followed them up for a decade, and found little benefit from dietary change. Intervention trials for diet have continued, since then, to produce negative results. Maybe they're technically too difficult...

But what about vitamin tablets? They're easy to study, in the sense that it's easy to take a tablet - easier than changing your whole food lifestyle - easy to find a placebo control for, and so on. And there have been innumerable studies, and systematic reviews of those studies, and meta-analyses of those studies, **and they have found no benefit for antioxidants.** A meta-analysis – a mathematical combination of lots of smaller studies to give one larger and more accurate answer - of 15 studies, a total of over 200,000 patients, being followed up for between 1 and 12 years, found [no benefit](#) for cardiovascular outcomes. The current [Cochrane Review](#) on antioxidants and bowel cancer had just as many patients, and again found no benefit for the pills.

That must be the single most prevalent claim of the whole alternative therapy industry: and it is in stark contradiction of the experience of hundreds of thousands of individuals who have been carefully studied in these trials, examining the very advice the alternative therapy industry is giving. If they can't get that one thing right, why would you listen to them on anything else?

References:

Use of antioxidant vitamins for the prevention of cardiovascular disease: meta-analysis of randomised trials. Lancet. 2003 Jun 14;361(9374):2017-23. [Link](#).

Antioxidant supplements for preventing gastrointestinal cancers, Bjelakovic G, Nikolova D, Simonetti RG, Gluud C. The Cochrane Database of Systematic Reviews 2006 Issue 2 [Link](#).

Multiple risk factor intervention trial. Risk factor changes and mortality results. Multiple Risk Factor Intervention Trial Research Group. JAMA. 1982 Sep 24;248(12):1465-77. [Link](#)

“How To Read A Paper” by Trisha Greenhalgh is magnanimously available free online at the BMJ website. [Link](#).