

Botox

In a study, 15 patients suffering from back pain were assigned to receive the drug botulinum (Botox) and 9 of those patients reported a substantial decrease in back pain (Foster et al, 2001).

- a) Would you conclude that Botox is an effective treatment for back pain? Why or why not?
No, perhaps the patients were going to have less back pain naturally due to the normal healing process.

An alternative design might be to randomly assign 15 subjects to come to a clinic and receive Botox treatment and have 15 subjects receive no treatment.

We then compare pain reduction between the two groups.

- b) What are two ways that this is an improvement over the original design.
Random assignment ensures you do not have a confounding variable influencing the results. Using a control group that receives no treatment gives us the ability to compare the natural healing process to the effect that the drug has.
- c) What's a flaw in this design that would still prevent researchers from concluding that Botox helps back pain, even if the treatment group experiences much more pain reduction than the non-treatment group? (what's the confounding variable?)
The group receiving the treatment might show improvement merely because they are aware they are receiving treatment. This effect has been shown in several studies. The confounding var is "receiving treatment." Note in this set-up that it is certainly influencing whether they receive the drug (explanatory variable). According to the studies, it also apparently affects the response variable (whether back pain is reported as being decreased).
- d) How could you eliminate the confounding variable and create a better study?
Use a placebo treatment for the "nontreatment" group. This will ensure that both groups have the same effect of feeling as if they are receiving treatment. So we've eliminated all differences between the groups EXCEPT the explanatory var. If both groups have the effect of feeling as if they are being treated, we can still compare the group which is getting the drug to the group that isn't, without this generic "treatment effect" creating a confounding difference between the two groups.