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10th Sep,2018
Essay : Correlation Versus Causation

Article to critique: Drinking tea reduces non-CV mortality by 24 percent
https://www.eurekalert.org/pub_releases/2014-08/esoc-dtr082614.php

Tea is one of the popular beverages all over the world and is mainly consumed in Asia, the United Kingdom, some parts of North Africa and Europe. According to an observational study presented at ESC Barcelona in 2014, drinking tea reduces non-CV mortality by 24 percent. The study, done by a French Professor Nicolas Danchin,included 131401 people aged 18 to 95 years who had a health check done at the Paris IPC Preventive Medicine Center between January 2001 and December 2008.
The study was done based on beverage intake consumption(tea and coffee) information provided by a self-administered questionnaire.

Interestingly enough, even though the study closely monitored tea and coffee drinkers and their smoking habits but doesn't mention their alcohol consumption habits. Alcohol is considered as the number one health problem in France.It is possible that the non tea/coffee drinkers had higher addiction to alcohol and hence their mortality rate was higher than tea drinkers. In other words, tea may not be the cause of the lower mortality but the confounding factor alcohol might be the cause of higher mortality among non-drinkers.
Moreover, the study did not reveal whether each group had the same (or at least comparable) sample size or not for fair comparison.

Among the subjects under study, tea drinkers have the reverse profile than that of coffee drinkers. They were much more physically active,have less percentage of smokers than the coffee drinkers. Even though there appears to be a correlation between drinking tea and good health, as the author also concluded, one cannot infer that drinking tea leads to good health. France is known as a nation of coffee and wine, the act of drinking tea is not common and often considered elitist or tied to a certain ethnicity. Maybe these small tea drinking populations are much more health aware than the rest of France. They might exercise more, tend to have a healthier weight, they're more likely to cut the fat off their meat, they're more likely to jog more likely to pick up fresh produce and other healthy ingredients for their fridge than coffee drinkers.Health awareness makes them non smokers and hence, one might argue, healthy choice leads to reduction of mortality, not tea. Also, French tends to prefer more delicate and flavored tea, compared to the stronger brews across the English Channel that have higher caffeine percentage.

The researcher assumed that all subjects under observation enjoy equal health conditions and share the same life expectancy which may not be the case. Life expectancy is affected by various socioeconomic factors, including employment, income, education and economic well being, social factors, genetic factors and environmental factors. The study did not appear to have considered socio economic status of the people under observation. Among the subjects, the mean age of coffee drinkers were more than non drinkers; it's only natural that older people will die of old age and it just so happened that they used to drink coffee. Volunteers were only followed-up over a period of 3.5 years, may be many tea drinkers died soon after and hence missed out from the study results.

Tea comes in various forms and is prepared in various ways across the world. Though the stronger variety,as the Britishers' prefers, has more percentage of caffeine,the greener alternative has antioxidants with much less percentage of caffeine. Herbal tea is caffeine free and is packed with antioxidants .South east Asian boil tea with milk and sugar that make its original compound Catechin,

a natural phenol and antioxidant loses its strength. Hence, a study done among French population (in a specific clinic) cannot be generalized across the globe as the researcher seems to have done.

Ideally, we should be conducting a quasi-experiment with three groups divided by their beverage drinking preference (none, tea drinker and coffee drinker) . But the three groups should have the same or comparable sample size for fair comparison. The distribution of the properties of the participants in each group (like health, socio economic condition, cigarette and alcohol consumption habits, age, gender etc) should be the same. Once the groups are identified for study, we should be following them till their old age in order to infer whether drinking tea is actually improving life expectancy, all other factors remaining constant. Such experiments, though looks good on pen and paper might be expensive to conduct over so many years. Moreover, it's hard to keep the human behaviors fixed over the years. Participants might start consuming more alcohol (because of stress , depression or otherwise), eat unhealthy food leading to obesity related health issues or stop exercising. This might lead to wrong results.

In conclusion, tea might not be the true driver of the reduced mortality, there might be other contributing factors that can only be identified when the study is done in a controlled environment.

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