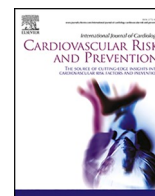




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## Change and the Perils of Induction

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In the October 13, 2020 issue of the International Journal of Cardiology Hypertension I published an article entitled "Clinical trials may be unethical in certain instances." [1] I stated that this is primarily due to an imbalance in the stopping rules. It is possible that in a hypothetical clinical trial, serious adverse events (stroke, death) may occur by chance more frequently in the active group. Stopping the clinical trial according to the commonly used rule (DeMets and Lan) would be statistically sound but may be associated with many more serious adverse events [2].

In this commentary I wish to clarify that in addition to the reason given above, clinical trials may arrive at incorrect conclusions. This may be clarified by examining the final cause (reason for existence) of the trials or other entities as they have existed since antiquity. Here, I discuss briefly the elements of medical inference as it has existed for the last 22 centuries. There are patterns in nature i.e. the past predicts the future, inference by previous thinkers, statistics and data mining. Aristotle in the Physics in the 4th century BC stated that there are four causes

for the construction of an item e.g. a boat. The formal cause, describing the concept of a boat, the material cause i.e. wood and nails, the efficient cause i.e. a carpenter who would take the wood and nails and make it a boat suitable for sailing, and the final cause, the purpose for which the boat was built.

On the contrary, Charles Robert Darwin describes evolution, in his paper "On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life", a work that is considered to be the foundation of evolutionary biology.

Thus, one may stipulate that the final cause of Aristotle is analogous to evolution of Darwin. As David Hume predicted in 1748, correct relationships are demonstrated by the "constant conjunction" and that cause relationships are demonstrated not by induction, but by observation [3].

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