Absolute Risk Reduction

In epidemiology, the absolute risk reduction, risk difference or absolute effect is the change in the risk of an outcome of a given treatment or activity in relation to a comparison treatment or activity.

It is the inverse of the number needed to treat.

In general, absolute risk reduction is the difference between one treatment comparison group's event rate (EER) and another comparison group's event rate (CER). The difference is usually calculated with respect to two treatments A and B, with A typically a drug and B a placebo. For example, A could be a 5-year treatment with a hypothetical drug, and B is treatment with placebo, i.e. no treatment. A defined endpoint has to be specified, such as a survival or a response rate. An example is the appearance of lung cancer in a 5-year period. If the probabilities pA and pB of this endpoint under treatments A and B, respectively, are known, then the absolute risk reduction is computed as (pB − pA).

Example:

The absolute risk reduction of shunt dependency with tandem fenestration was 14.7%. Therefore, 6.8 patients would have to undergo tandem fenestration of the LT and MoL to prevent a single VP shunt placement following aSAH. Prior works, as well as our own univariable analysis, demonstrated greater risk in those with greater subarachnoid blood, as evidenced by a Fisher grade of 3 or 4, the presence of intraventricular hemorrhage, and/or need for placement of an EVD.1,32 In subgroup analysis of those at greatest risk, we found an even lower number needed to treat in individuals at great- est risk for shunt-dependent hydrocephalus, as evidence by a number needed to treat of 4.8, 5.8, and 3.7 in those with intraventricular hemorrhage, a high Fisher grade, and re- quiring placement of an EVD, respectively [1)].

1)
Winkler EA, Burkhardt JK, Rutledge WC, Rick JW, Partow CP, Yue JK, Birk H, Bach AM, Raygor KP, Lawton MT. Reduction of shunt dependency rates following aneurysmal subarachnoid hemorrhage by tandem fenestration of the lamina terminalis and membrane of Liliequist during microsurgical aneurysm repair. J Neurosurg. 2017 Dec 15:1-7. doi: 10.3171/2017.5.JNS163271. [Epub ahead of print] PubMed PMID: 29243978.