ASSOCIATION

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Community project lecture

Fifth Class

It is the inference that are gained from observation of a set of cases of illness that are accompanied by a suspected factor, or it means relation between two variables.

TYPES OF ASSOCIATION:

1- Direct association (causal association-causation): It is the causal relationship, which does not give any doubt. E.g. measles virus cause measles disease.

2- Indirect association: The effect is due to another hidden factor, it is most commonly due to the presence of confounder. E.g. smoking associated with ischemic heart diseases but confounder is coffee drinking.

3- Spurious association: There is no association between the factor and the effect, but the study was not properly conducted. It also called fictitious association.

4- Artifactual association: It is the association that appears due to faulty design or analysis of a study.

THE MAIN CRITERIA (MILL`S CRITERIA) OF CAUSAL ASSOCIATION

The major criteria:

1. Strength of association: It is measured by relative risk e.g. relative risk in lung carcinoma among smokers compared to non smokers is 8 times this mean high relative risk then strong association .

2. Temporal relationship (time sequence is logical): This mean the cause precedes the outcome. E.g. H.pylori cause chronic gastritis then duodenal ulcer.

3. Specificity of association: the outcome specifically due to this cause not other, e.g. the prevalence of H.pylori infection in patients with duodenal ulcers is 90%-100%.

4. Consistency: This means different studies in different times on different population by different approach all give the same finding. As e.g. about H.pylori and D.U.

5. Coherence with the existing Knowledge (biological plausibility): e.g. the mucosa that is infected with H.pylori will be weakened and will become susceptible to the damaging effects of the gastric acid.

THE FOLLOWING MINOR CRITERIA:

6. Dose response relationship: It means dose of exposure increases then the risk of disease also increase. E.g. increase cigarette smoking increase risk of lung cancer.
7. The reversibility: If a factor is a cause of a disease, the risk of the disease is expected to decline if the factor reduced or eliminated.
8. Analogy: We analog the findings together.

THE RELATION BETWEEN FACTOR AND OUTCOME AFFECTED BY:

1. Chance: This means that there is no relationship between the factor and the outcome, and what we had observed was due to chance. This can be excluded by a proper statistical test which is p-value and when it is less than 0.05 what does it mean?

This means that the chance does not have a role of more than 0.05 (5%) in developing the outcome.

2. Confounder: It is a third factor sharing with exposure that increased or decreased the probability of outcome occurrence. It is not an error in the study.

3. Bias: It is a systematic error not random in an epidemiological studies that result in an incorrect estimate of association between exposure and outcome.

Sources of Bias

1: Selection bias: selection of study group individuals.

2. Observational bias (information): This include:

2.a. Recall bias: case under study not remember information as in case-control study.

2.b. Interviewer bias: It occur in those collecting data.

2.c. Loss to follow up: Either by migration, death, or case refuse continuation in study this happened in cohort study.

2.d. Misclassification: It occurs when subjects are wrongly categorized with respect to either exposure or disease state.