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Short Commentary

A Universal Diagnosis Syntax (UDS) for Clinical Trials and Case Studies

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Description

Diagnoses and parts of diagnoses are fundamental tools in clinical research. I have developed a general diagnosis syntax that may be useful in stratifying clinical problems making them better suited to clinical trials and case studies.

Apt choices of symbols play a major role in science. Here, diagnoses (d) are generated by the formula d:=e&o&p where '&' and ':=' mean concatenation and assignment, respectively [1]. The variables e, o, and p are assigned to names of an etiological agent, a disorder, and a pathogenetic mechanism, respectively, as illustrated in figure 1.

The diagnosis 'dementia' may illustrate how a stratification may proceed. This diagnosis covers hypofunction in several cortical regions, for example, d='frontotemporal hypofunction' [2]. Symptoms, signs, and abnormal supplementary investigations of dementia may derive from diminished function in various cortical and subcortical structures. If a dementia is caused by an infection, then the pathogenesis is an immune reaction, necrosis and scaring are expected. but degeneration due to neuron and/or glial apoptosis is unlikely. On the other hand, the pathogenesis may be circulatory, e.g., multiple infarctions, which points to other etiologies, for example hereditary hypercholesterolemia and chemicals (smoking, drugs). A more specific partial diagnosis pointing out the cortical localization would be o='fusiform gyrus atrophy and hypofunction' that might explain prosopagnosia [3, 6]. In addition, studies on drug effects may be confounded by effects of drugs on the etiology, pathogenesis rather than the selected disorder.

The diagnosis dementia is incomplete since it says nothing about etiology, disorder, or pathogenesis. Further investigations may decide whether the etiology is heredity (mutation), mechanical trauma, infectious, or due to chemicals (drugs) [3, 4]. The pathology can be made more precise by stating tissue volume changes and structural abnormality, for example 'atrophy due to degeneration'. If the degeneration is due to hyper apoptosis, then the pathogenesis involves neither inflammation nor an immune reaction. In contrast, necroptosis comes with an immune reaction [5, 6].

Conclusion

Clinical trials of disorders like dementia may be confounded by lack of stratification on etiology, the disorder, and pathogenesis. Stratification based on UDS is a general tool available to all clinical studies.

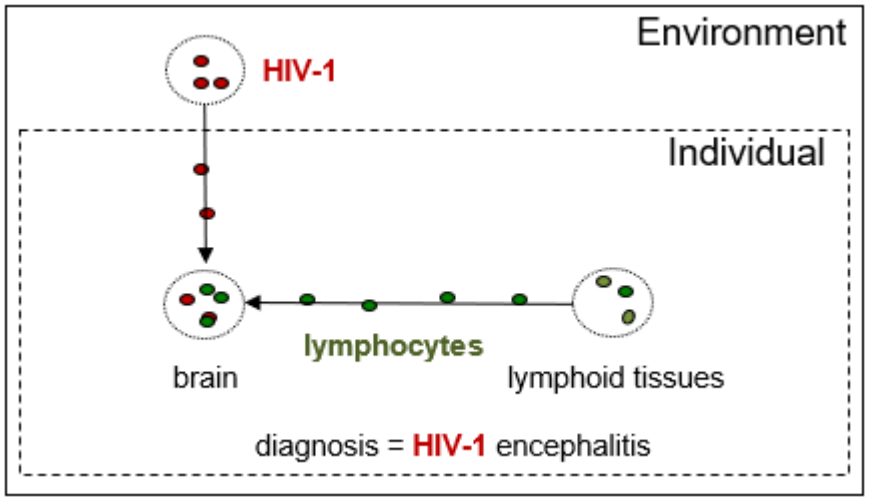

Figure 1: The diagnosis HIV-1 encephalitis is interpreted into a model. The etiology (e) is the red virus that invades the brain and causes a brain disorder (o). The pathogenesis (p) is an immune reaction type 4 indicated by the invasion of lymphocytes.

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