

Preliminary Evidence of Impaired Thinking in Sick Patients

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Background: Earlier anecdotal observations suggested to us that certain aspects of judgment in sick adults approximate the thinking of children.

Objective: To describe changes in judgment associated with serious illness in otherwise competent adults.

Design: Cohort study.

Setting: Urban acute-care hospital and senior citizen center.

Participants: Sicker (Karnofsky score ≤ 50 ; $n = 24$) and less sick (Karnofsky score > 50 ; $n = 39$) hospitalized patients were compared with controls ($n = 28$). Normal performance on the Mini-Mental State Examination (score ≥ 24) was required for study entrance.

Measurements: Seven Piagetian tasks of judgment designed to

study childhood cognitive development. Degree of sickness was determined by using the Karnofsky scale of physical function.

Results: Patients with Karnofsky scores of 50 or less responded correctly to fewer Piagetian tasks than controls (mean [\pm SD], 1.8 ± 2.6 vs. 5.9 ± 1.6 ; $P < 0.001$). Furthermore, a smaller proportion of sicker patients responded correctly to each of the seven tasks. Patients with Karnofsky scores greater than 50 did not perform differently than controls.

Conclusion: In sicker hospitalized patients, performance on seven Piagetian tasks of judgment was similar to that among children younger than 10 years of age. This evidence of cognitive impairment warrants further investigation.

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Clinicians have long known that sick persons, although appearing to have normal mental capacity, may have difficulty thinking clearly when presented with complex clinical choices. Twenty-five years ago, one of us published observations suggesting that very sick patients might reason in a manner similar to children younger than 10 years of age (1).

We report the results of a study that examined the performance of hospitalized patients on seven conservation tasks devised by the developmental psychologist Jean Piaget to measure the cognitive development of children. We hypothesized that sicker patients would have impaired performance on these tasks compared with controls, but that less sick patients would not perform differently than controls.

METHODS

Study Sample

We recruited 63 patients and 28 controls. This sample size provided sufficient statistical power (>0.80) to detect large effect sizes (0.70). Patients had been consecutively admitted to the thoracic surgery and general medical services of the New York Presbyterian Hospital, New York, New York. The controls came from a non-residential senior citizen center. All participants spoke English and had at least a high school education. In

addition, participants had to have a score of 24 or higher on the Mini-Mental State Examination (MMSE) (2, 3) to be eligible to participate in the study. The Institutional Review Board of New York Presbyterian Hospital-Cornell University Medical Center approved the study. Each participant gave oral informed consent.

Assessment Procedures

The same investigator performed all testing. Patients were tested at the bedside, and controls were tested individually at the senior citizen center. An MMSE was administered to all potential participants. A Karnofsky scale rating of physical functioning (4) was then assigned for each participant. This well-established and widely used scale provides a rank order of illness based on 1) the degree to which independent functioning is impaired and 2) whether and how much care is required. We classified patients with Karnofsky scores less than 50 (indicating that the patient requires considerable assistance and frequent medical care) as sicker and those with scores of 50 or greater (indicating that the patient requires occasional assistance and cares for most personal needs) as less sick. The seven Piagetian tasks were administered in the same order to all participants, and the entire bedside procedure took approximately 15 to 20 minutes.