Use of the Computer Program GIDEON at an Inpatient Infectious Diseases Consultation Service

Str—We read with interest the article by Edberg [1], which describes the Global Infectious Diseases and Epidemiology Network (GIDEON). GIDEON is a subscription-only computer program that constructs a differential diagnosis, ranked in order of percent probability, on the basis of clinical data entered by the user for >300 infectious diseases. In this letter, we report our experience using GIDEON at the inpatient infectious diseases consultation service of a busy quaternary care hospital in Baltimore, Maryland.

In June 2005, 50 inpatient consultations were selected randomly to undergo comparison testing with GIDEON. All clinical data gathered from each consultation were entered into GIDEON, regardless of perceived clinical relevance. The diagnosis that was determined to be most likely by the attending-led consultation team was compared with the differential diagnosis generated by GIDEON. We also compared the final discharge diagnosis reported by the primary medical team with the top diagnoses recommended by the consultation service and GIDEON.

In 6 (12%) of 50 cases, the number 1 diagnosis recommended by GIDEON matched the diagnosis recommended by the consultation service. For 11 (22%) of 50 cases, the consultation team’s diagnosis was among the top 5 diagnoses generated by GIDEON. The consultation team’s top diagnosis matched the discharge diagnosis in 46 (92%) of 50 cases, whereas GIDEON’s top diagnosis did so in 6 (12%) of 50 cases. For 32 (73%) of 44 cases in which GIDEON’s top diagnosis did not match the discharge diagnosis, the final diagnosis was not found in GIDEON’s database. The majority of these cases represented infections complicated by surgical hardware, central-line placement, pathogens not specified by GIDEON, and medication-management dilemmas.

The results of our trial with GIDEON suggest that this program may be of limited use for inpatient infectious diseases consultation services at large tertiary-care or quaternary-care hospitals. A significant number of consults at our hospital address problems that stem not only from purely infectious causes, but from other factors as well, including surgical complications, medication effects, and social factors, such as injection drug use. None of these factors can be entered into GIDEON.

Interest in computer-based diagnostic programs for use by internal medicine and infectious diseases specialists has been longstanding, albeit with mixed reviews [2, 3]. An independent evaluation of GIDEON for inpatients admitted to the hospital with fever showed 33% accuracy of GIDEON in providing the correct diagnosis as its first choice for inpatients admitted with fever [4]. Although accuracy increased to 60% when only clinical information deemed relevant by the user was entered, physicians always remained superior in elucidating the correct diagnosis.

Both GIDEON and previously tested programs have been demonstrated to be of value in suggesting alternative diagnoses not originally considered by the medical team but thought to be relevant to particular clinical scenarios [3, 4]. However, if clinical judgment is needed to select which data are relevant, if the costs of subscription are prohibitively high, and if infectious diseases teams at major hospitals are unable to utilize these programs effectively, then the optimal place for computerized diagnostic programs such as GIDEON appears to be in other medical settings.

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References

Carbapenem Susceptibility Discords among Acinetobacter Isolates

Str—we read with great interest the case report of a fatal Acinetobacter baumannii infection with discordant carbapenem susceptibility by Lesho et al. [1]. This report implies that such cases are uncommon and that, in fact, it was “the first report of clinically relevant discordant carbapenem susceptibilities” [1, p. 759]. We have 6 years of surveillance experience with the Meropenem Yearly Susceptibility Test Information Collection (MYSTIC) Program (USA) and have consistently documented the greater potency and high susceptibility rates for imipenem, compared with those for meropenem, when Acinetobacter species are being tested [2–5]. The results in the United States were further validated by reports from other surveillance programs [6] and several MYSTIC Program publications summarizing findings of Acinetobacter species, especially in Europe [7].

In brief, Lesho and colleagues [1] cited MYSTIC Program results in one article [2] that did not compare findings for imipenem and meropenem tested against clonal multidrug-resistant strains of Acinetobacter species, and the second article they cited [3] clearly demonstrated that meropenem was inferior in activity to imipenem (MIC90, 1/32 vs. 0.25/16 μg/mL) and the percentage of strains inhibited at the breakpoint concentration of ≤4 μg/mL (percentage of isolates susceptible, 84.1% vs. 88.4%) [8, 9]. This “discord” in carbapenem activity against Acinetobacter species, in favor of imipenem, is routinely found to be reversed for Pseudomonas aeruginosa; among P. aeruginosa isolates analyzed in the United States, meropenem has a 2-fold to 4-fold greater potency than imipenem and a percentage susceptibility advantage of ~4%–5% [3].

Contemporary susceptibility testing standards [8, 9] in the United States categorize imipenem and meropenem together; the 2 drugs appear in the same box in table 1 of the Clinical and Laboratory Standards Institute (previously the NCCLS) document M100-S15 [9]; this table “designates clusters of comparable agents that need not be duplicated in testing, because interpretive results are usually similar and clinical efficacy comparable” [9, p. 94]. However, the word “or” is not present between the carbapenems that “designates a related group of agents that has an identical spectrum of activity and interpretive results, and for which cross-resistance and -susceptibility are nearly complete” [9, p. 94]. This standards document clearly states that although very similar with respect to spectrum and potency against P. aeruginosa and other non-Enterobacteriaceae or Acinetobacter species, findings for imipenem should not be used to predict those for meropenem, or vice-versa [8, 9].

We agree with Lesho et al. [1] that discords between the susceptibilities of carbapenems may be observed when nonfermentative Gram-negative bacilli are being tested, and that the carbapenem selected for therapy should also be tested by the clinical laboratory to guide treatment. However, our experience with carbapenem resistance surveillance worldwide indicates that such discords are not unusual and will occur frequently in the context of contemporary infectious diseases practice.

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