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Case mortality in polymicrobial bloodstream infections

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High mortality in polymicrobial bloodstream infections has been sporadically noted in the U.S. medical literature since the 1960s. Few studies provided comparative data, but those that did showed case mortality in polymicrobial infections roughly twice that in monomicrobial infections [1–3]. Authors reported that the percentage of bloodstream infections that was polymicrobial was increasing [2], that polymicrobial bloodstream infections were typically nosocomial [3], and that mortality was higher in nosocomial than community-acquired polymicrobial bloodstream infections [4]. The higher mortality in polymicrobial bloodstream infections was reported to be associated with inappropriate therapy [5,6], absence of fever [3, 4], and a variety of microbiologic and clinical factors [7,8]. A spike of interest in the late 1980s seems to have prompted slightly improved reporting in the early and mid 1990s (see Fig. 1), but the topic itself almost disappeared from discussion, and interest has not yet revived. For instance, a report on nosocomial bloodstream infections in U.S. hospitals in 1995–2002 included data that suggests the case-mortality gap between polymicrobial and monomicrobial infections may have narrowed, relative to the studies cited above–partly through increased mortality in monomicrobial infections–but again the topic was not mentioned [9].

In Norway, a comparison of hospital records from 1988–1989 to those from 1974–1979 found a doubling in the incidence of bloodstream infections, a shift in their microbiologic composition, “a marked increase” in polymicrobial episodes, and an association of polymicrobial bloodstream infection with nosocomial acquisition and higher mortality; mortality had dropped dramatically between the two periods, but by 60% more among monomicrobial than polymicrobial infections [10]. The comparative data available from Israel in the 1990s showed a case-mortality ratio nearly identical to that in the United States [11, 12]. In Spain, an ICU case series reported a case mortality in polymicrobial bloodstream infections only one quarter that in monomicrobial bloodstream infections [13], although a model published in this journal, based on all bloodstream infections in another Spanish hospital in 1991–1997, found polymicrobial bacteremia a key predictor of mortality [14].

Whatever cause–effect relationships may be involved in this differential case mortality, and in the differences in differential case mortality, it seems certain that these critical questions could be addressed much more effectively now, by clinical epidemiologists exploiting technical and analytic advances. The time seems right for a revival of interest in polymicrobial bloodstream infections.

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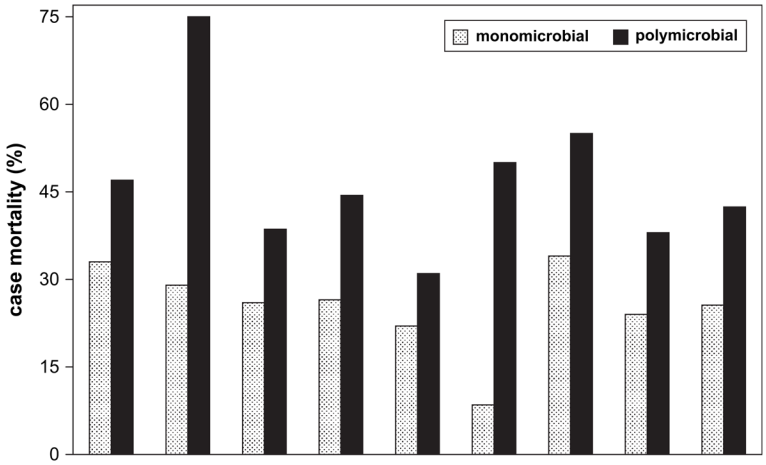

Fig. 1.

Nine studies published in the 1990s included comparative case-mortality data on polymicrobial and monomicrobial bloodstream infections in HIV-negative patients in U.S. hospitals. The data are shown in left-to-right order [15–23] from the lowest (14%) to the highest (43%) percentage of total infections that were polymicrobial. These data indicate a mortality gap similar to that in the earlier reports cited in the text (ie, the average mortality was 47% for polymicrobial infections and 25% for monomicrobial infections, with an average ratio of 2.15).