

Comparison by Systems and Specialties of Medical Outcomes in Patients with Hypertension and Non-Insulin Dependent Diabetes Mellitus

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Abstract

This observational study compared the health outcomes of patients with hypertension and non-insulin dependent diabetes mellitus who received medical care from either generalist or subspecialty physicians through one of three systems of care. Participating healthcare systems were located in Boston, Los Angeles, and Chicago, and included health maintenance organizations, fee-for-service providers (solo practice or small single-specialty or multispecialty groups), and independent practice associations (solo practice or small single-specialty or multispecialty groups providing prepaid care). Principal providers were family practitioners, general internists, cardiologists, or endocrinologists. Over a 2-year period, 532 patients with hypertension and 170 patients with NIDDM were observed with entrance and exit histories, physical examinations, and laboratory tests. Using a larger sample, functional outcomes of patients were also assessed at 4 years, and mortality was assessed at 7 years. We found no evidence that any physician specialty or system of care achieved consistently better outcomes at 2 or 4 years for patients with either hypertension or NIDDM. The single difference in outcome by specialist group was observed among endocrinologists, whose clinical outcomes were better than those of family practitioners. No adjusted mortality differences were seen at 7 years among systems or physician specialties.

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An estimated 50 million Americans currently receive healthcare services through health maintenance organizations (HMOs). Enrollment in HMOs has tripled in the past decade. Although concern has been expressed that this trend away from traditional fee-for-service (FFS) may result in worse health outcomes for patients, few studies

have been published comparing utilization and outcomes of traditional systems and managed care. Studies that have provided helpful information on utilization and quality of care have focused on a single disease in restricted settings¹⁻³ or on relatively well patient groups.^{4,5}

In earlier reports of the Medical Outcomes Study (MOS), our group compared resource utilization patterns and health outcomes in patients under different systems of care and by different physician specialties.⁶⁻⁹ The findings showed that physicians in prepaid HMOs and independent practice associations (IPAs) used fewer patient services for equivalent patients than did FFS groups, and that endocrinologists and cardiologists appeared to use more services for equivalent patients than did family practitioners and general internists. Fee-for-service groups had 41% more hospitalizations than did HMOs, and FFS patients took 12% more prescription drugs.⁹

The question remains whether lower rates of healthcare utilization lead to similar, better, or worse patient outcomes. In the most current segment of the MOS¹⁰ we analyzed a variety of outcomes in patients with two prevalent diseases—hypertension and non-insulin dependent diabetes mellitus (NIDDM)—to address this question.

... METHODS ...

Study Sites

The MOS was conducted in three cities: Boston, Chicago, and Los Angeles. One HMO was selected in each city; physicians and patients were randomly sampled. Twelve multispecialty groups (MSGs) serving the same areas as the HMOs were also sampled. Physicians in the MSGs were either family practitioners, general internists, cardiologists, or endocrinologists.

Study Population

Of eligible clinicians practicing in groups (HMOs or MSGs) who were asked to participate, 170 (81%)

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contributed patients, and of 363 solo and small single-specialty group practices asked to participate, 197 (54.3%) contributed patients. All patients seen by each enrolled clinician during a 2-week period were asked to participate, and 20,222 (71.6%) agreed to do so.

Analysis

The study was designed to determine aggregate mean differences between healthcare delivery systems and specialties. Mean differences and confidence intervals of 95% were computed for HMO and FFS systems, and between IPA and FFS systems. Data from both patient sets, hypertension and NIDDM, were adjusted for age, site, sex, race, education, income status, complications, and comorbidities. Data from specialties were similarly analyzed.

Several supplemental analyses were also undertaken to estimate the magnitude of missed effects. Based on earlier research, a summary clinical outcomes index and a summary functional status index were constructed to test for comprehensive benefits of one group over another (eg, HMO versus FFS).

Hypertension Findings

In general, patients with hypertension were excluded from the study if they were uninsured or had medical conditions that were so overwhelming that hypertension would play only a minor role in overall health status. Of the 5,475 patients identified with hypertension, clinical outcomes of 532 patients were assessed at 2 years with history and physical examination performed by MOS personnel and laboratory tests performed by a central laboratory. Additionally, the functional status and well-being of 1,044 patients was assessed at 4 years with the 36-item Short Form Health Survey (SF-36).^{11,12}

There were no significant differences in mean outcomes among patients by system of care (HMO, IPA, or FFS). Of the 532 patients with hypertension examined at 2 years, changes in status (blood pressure, physical functioning, role performance associated with physical functioning, general health, and energy level) were equivalent. Other analyses also demonstrated no significant differences in good outcomes among the three systems. After adjustment, the reduction in blood pressure after 2 years for patients whose baseline systolic blood pressure was greater than 155 mm Hg was equivalent at 10.6, 9.8, and 10.7 mm Hg (16.6%, 18%, and 20.8% of patients in HMO, IPA, and FFS, respectively). Two-year diastolic blood pressure reduction among patients with baseline pressure above 95 mm Hg were also equivalent.

Similarly, of the 1,044 patients studied at 4 years, there were no significant differences in patient-reported functional status and well-being on the basis of healthcare system. When physician specialties were compared, the only statistically significant difference in outcomes during the 2-year period was among patients of general internists, who showed lower systolic blood pressure levels than did patients of family practice physicians.

NIDDM Findings

Patients with diabetes were excluded from the study for a number of reasons, including recent surgery or coexisting serious illness or physical disability, or because their MOS physician was not primarily responsible for their diabetes treatment. Of the original 20,222 patients who agreed to participate in the study, 1,425 patients were identified with NIDDM. At 2 years, 170 of these patients were assessed clinically with a history and physical examination performed by MOS personnel, which included blood pressure measurement, foot inspection, vibration perception, and vision testing. Laboratory assays including glycosylated hemoglobin level and albumin excretion rate were performed by a central laboratory. At 4 years, the functional status and well-being of 317 patients was assessed by questionnaire.

In the 170 patients with NIDDM who were studied at 2 years, there were no significant differences in patient outcomes by system of care. In terms of functional status and well-being, there were no significant differences among the three systems of care at either 2 years or 4 years.

A significantly higher percentage of diabetic patients seen by endocrinologists had foot ulcers than did patients who were seen by general internists. The reason for this finding was not clear. During the 2-year study period, patients seen by endocrinologists showed significant improvement in foot infections and foot ulcer prevalence compared with patients of general internists.

During this 2-year period, no significant differences were seen among the three specialties in glycosylated hemoglobin levels, functional status, vibration sense, vision, albumin excretion rates, or blood pressure. Of 317 patients studied at 4 years, functional status and well-being were also equivalent among the three specialties.

Mortality Rates

At 7 years, mortality rates for 1,296 patients with hypertension and 424 patients with NIDDM were compared by healthcare systems and specialties.

Mortality rates were adjusted for income level, age, sex, and employment status. For patients with hypertension, mortality rates were also adjusted for presence of diabetes, and for the presence of congestive heart failure at baseline. For patients in the NIDDM group, mortality rates were adjusted for diabetes complications and comorbid illness. Differences in mortality rates in patients with hypertension were not significant by either system of care or physician specialty.

In patients with NIDDM, mortality rates did not differ significantly among the three systems of care. We observed borderline statistically significant lower mortality rates for family practice physicians compared with general internists and endocrinologists. The samples were small, and we inferred that the family practice mortality rate was more consistent with expected values and chance than with a true difference.

General Findings

Although the number of outpatient visits was equivalent in hypertensive patients in all three systems, patients in FFS systems were substantially more likely to be treated by subspecialty internists than were patients in the other two systems. Among patients with NIDDM, significantly fewer HMO patients than FFS or IPA patients were treated by subspecialists. These findings are consistent with our earlier research.⁹

In the overall analysis of findings in patients in both the hypertension and NIDDM groups, we detected no differences in mean outcomes attributable to systems of care. There were some advantages attributable to specialty. For example, in terms of clinical outcomes, family practice physicians performed somewhat less well overall than subspecialty physicians. However, the summary functional status showed a trend in the opposite direction. Overall, no consistent advantages were associated with any one specialty.

Study Limitations

Several factors mitigate against any ability to generalize findings in this study. The study was observational and nonexperimental. Additionally, all patients entered in the study had received treatment from their participating physician for at least 1 year, meaning that some differences in health outcomes observed in the study may have been due to events occurring before the study began. Furthermore, all of the physiologic outcomes were assessed during the first 2 years of the study, a length of time that may be

insufficient to observe important advantages conferred by a system of care or a medical specialty. It should be noted, however, that functioning and well-being measured at 4 years and mortality determined at 7 years confirmed the 2-year results.

Study results also may have been affected by geographic and practice limitations. The study was conducted in three large cities, and only three HMOs and 12 MSG practices were studied. The physicians in the study were not necessarily representative of all physicians in these cities or in the entire country.

In addition, the more intense care provided by the FFS system and by subspecialists may have maximum impact on very sick patients; such patients were not studied here in large numbers. The MOS sample did, however, represent most patients seen in office practice. Finally, in some analyses in the study, the numbers of patients were small and precision was limited.

Study Implications

In an earlier report of the MOS study, Rubin et al studied patient reports of satisfaction with care they had received, comparing solo or single-specialty physicians, MSGs, and HMOs, and also comparing prepaid and FFS systems.¹³ These researchers found that patients of solo or single-specialty physicians rated their care better than did HMO patients. However, the findings of the current study demonstrate that while there are differences among patient perceptions, there are no differences in health outcomes among systems of care. MOS findings related to outcomes and costs indicate that HMOs obtain equivalent outcomes when compared with FFS systems, with higher utilization costs in the FFS system.

... CONCLUSION ...

Within the limits of the MOS study, policy ramifications are clear. First, all systems should adopt information and management systems to determine what their patient outcomes are. Second, prepaid systems of care should strive to address patients' perceptions, informing them of levels of healthcare outcomes. Third, FFS systems and subspecialists should aim to reduce their charges in the absence of demonstrable better outcomes.

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