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Physician Behavior Modification Using Claims Data: Tetracycline for Upper Respiratory Infection

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Professional Standards Review Organization claims data were used in defining, planning, implementing and evaluating an approach to an ambulatory medical care problem utilizing educational intervention. Modification of physicians' tetracycline prescribing behavior was achieved in an actual practice setting by personal visits from peer physicians.

FEW SUCCESSFUL physician behavior modification strategies have been described for ambulatory care using claims based data.[1,2]

The New Mexico Professional Standards Review Organization (NMPSRO) Ambulatory Care Demonstration Project was funded to test the limits to which claims-based data could support professional review, to utilize data being collected as a part of the Medicaid Management Information System, and to study three specific areas, of which behavior modification of provider practices was one.[3] The goal of the Behavior Modification Project was to determine whether providers of ambulatory medical care could be influenced to change their diagnostic or therapeutic habits through personalized educational intervention. The following describes the planning, implementation and evaluation of one such effort.

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Methods

More than 15,000 tetracycline prescriptions were billed to the New Mexico Medicaid Program in 1976, making the drug one of the most frequently prescribed antibiotics in the program. Between January 1976 and June 1977, a total of 156 providers prescribed tetracycline 1,584 times for 1,346 ambulatory patients for diagnoses of upper respiratory infection, including viral upper respiratory infection, streptococcal pharyngitis, acute tonsillitis or acute pharyngitis.

The use of tetracycline for the above diagnoses was considered to be inappropriate by physician members of the PSRO.[4-6] Based on scientific merit, frequency and data identifiable from claims, this problem was chosen for a real-time behavior modification study. The 35 physicians most frequently prescribing tetracycline in ambulatory cases of upper respiratory infection as defined above were selected for the experimental and control groups.

These 35 physicians, constituting 22 percent

of the practice pool, wrote 975 (or 62 percent) of the tetracycline prescriptions for 801 patients.

Four variables—MD versus DO, urban versus rural, board certification versus none and prior NMPSRO contact versus no NMPSRO contact—were used in dividing the physician providers into four strata which were made as homogeneous as possible. Then the experimental and control physicians were selected randomly from each stratum. In this manner, 18 physicians were placed in the experimental group and 17 in the control group. The study group was reduced to 33 physicians when one control group physician was found to have died and another provider refused to be visited when contacted as a member of the experimental group. This left 17 physicians in the experimental group and 16 in the control group.

As a result of matching and random assignment to group, the average previsit prescription rate was higher in the experimental than in the control group. Therefore when evaluating the postvisit intervention effect, analysis of covariance was utilized with the previsit prescription rate as the covariate. The intervention for experimental group providers was to be a personal visit by a PSRO physician member; control providers were to receive no personal visit or other contact by PSRO.

Five physician consultants carried out the personal visits; two pediatricians, two internists and one family physician. Appointments were made personally on the telephone by the visitors, requesting 30 minutes time at the convenience of the physician to be visited. All of those participating as visitors took part in visit rehearsals to insure consistency. Visits were to be as nonthreatening as possible, maintaining an "educational" tone and presenting both claims data gathered for the physician in question and educational materials.[4-6] The message of the visit was to be that tetracycline was not the drug of choice for streptococcal infections, and not indicated in cases of viral upper respiratory infection.

The five physician consultants made visits to the providers, located throughout New Mexico, during six weeks in the winter of 1977-1978.

Results

In the six-month follow-up period, eight of 17 providers from the experimental group continued to prescribe tetracycline for upper respiratory infections while 15 of 16 control providers did so (see Table 1). This difference between the two provider groups is statistically significant (Fisher's exact test, $P<.01$). The mean number of prescriptions written by both experimental and control physician groups decreased significantly in the follow-up interval as compared with the preintervention period (experimental group, Wilcoxon signed rank test, $t=149.5$; $P<.001$; control, $t=117.5$; $P<.001$). However, analysis of covariance showed that the reduction in the mean number of prescriptions in the experimental group was significantly greater than that of the control ($F=4.34$, $P<.05$).

TABLE 1.—*Prescriptions of Tetracycline for Upper Respiratory Infections: Experimental Versus Control Providers*

Experimental Group Provider	*Prescriptions Before Visit Period 6-Month Average**	*Prescriptions After Visit Period 6 Months*	*Control Group Provider*	*Prescriptions Before Visit Period 6-Month Average**	*Prescriptions After Visit Period 6 Months*
E1	33.0	4†	C1	4.0	0
E2	33.0	0	C2	4.0	4
E3	26.5	1	C3	2.5	4
E4	24.0	0	C4	5.5	4
E5	21.0	9	C5	4.5	2
E6	13.0	1	C6	3.0	2
E7	10.0	1	C7	10.0	2
E8	6.0	0	C8	7.0	2
E9	6.0	3	C9	11.5	5
E10	6.5	10	C10	4.0	2
E11	8.0	0	C11	9.5	5
E12	6.0	1	C12	8.5	2
E13	2.5	0	C13	16.0	7
E14	5.5	0	C14	9.5	2
E15	4.5	0	C15	18.0	7
E16	3.5	0	C16	4.0	2
E17	4.5	0†			
Average Per Provider	12.6	1.8	Average Per Provider	7.6	3.2

*Two 6-month Jan-June periods (1976 and 1977) before the visits were averaged.
†These two entries represent only 5.5 months of data because the visits took place in mid-January 1978.

Discussion

A statewide PSRO was able to alter significantly for the better a scientifically sound medical problem by an educational intervention in which practicing physicians met with other practicing physicians. Personal visits had a positive impact on the prescribing habits of these providers.

Contamination of the control group ("word got around") could account for the reduction in the mean prescription rate in that group. Such change may not simply be a spurious study phenomenon. It may represent an analog to the placebo effect, one in which blinding is not successfully maintained. Or, it could be an indication

that mere communication of information to physicians, however informal, is sufficient to induce the desired effect. If true, then the effect of the intervention would be even stronger than that measured by this study.

A possible bias exists in having the top five providers in the experimental group. This, however, was believed to be statistically more tolerable than the bias which would have been introduced by having most MD's in one group and most DO's in the other, or most rural providers in one group and most urban in the other. By the use of covariant analysis, such bias has been minimized.

The goals of the project were achieved: the claims-based data system was used to define a problem of medical care delivery to the Medicaid population, an intervention method was planned, implemented and evaluated. The more basic problems of inappropriate use of antibiotics for nonbacterial respiratory infections, failure to obtain cultures to detect group A β-hemolytic streptococcal disease and interpretation of cultures of normal pharyngeal flora were not addressed.

This study shows that, at least in the short term, modification of physicians' prescribing habits is possible in an actual practice setting.

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Medical Practice Questions

EDITOR'S NOTE: *From time to time medical practice questions from organizations with a legitimate interest in the information are referred to the Scientific Board by the Quality Care Review Commission of the California Medical Association. The opinions offered are based on training, experience and literature reviewed by specialists. These opinions are, however, informational only and should not be interpreted as directives, instructions or policy statements.*

Reconsideration of Repository Emulsion Therapy

QUESTION:

Is repository emulsion therapy in the treatment of allergy conditions considered accepted medical practice? If so, for which conditions and under which circumstances?

OPINION:

It is the opinion of the Advisory Panel on Allergy that repository emulsion therapy is not considered accepted treatment for allergy conditions.