ABSTRACT

Objectives: Extensive discussion with renal patients about treatment intensity is not systematically integrated into their care and often occurs during an acute hospitalization. We conducted a “test-of-change” pilot study to assess the utility of providing an upstream discussion in the ambulatory setting as an additional nephrology consult to assist patients with chronic kidney disease considering treatment choices.

Methods: We randomly assigned patients with Stage 4 or Stage 5 chronic kidney disease who had not yet begun renal dialysis to 1 of 2 groups. The test group received the additional nephrology consult and met with an interdisciplinary team composed of a nephrologist, social worker, and clinical ethicist, and the control group did not. Qualitative data were collected in 2012 and 2013 via oral questionnaire. Both groups received a 6-month follow-up assessment.

Results: Patients who received the nephrology consult reported that they experienced help in forming a treatment plan, felt well understood, and had the opportunity to thoroughly discuss questions. The controls had a 26% increased probability of beginning dialysis and had a statistically significant increase in dialysis and clinic visits (p < 0.10 and p < 0.05). Controls also were likelier than the test group to be admitted to the hospital (0.5 vs 0.2 admissions per patient in the test group), spend more days hospitalized (2.8 vs 0.5 bed days per patient), and visit the emergency room (0.73 vs 0.66 visits per patient) and clinic (6.6 vs 3.6 visits per patient).

Conclusions: An additional nephrology consultation proved helpful both qualitatively and quantitatively.

INTRODUCTION

It is important that patients participate in medical decision making.1 Specifically for patients with chronic kidney disease (CKD), there is a need for more thorough upstream treatment intensity discussions.2 One study by Davison3 indicated that of 584 patients with Stage 4 and Stage 5 CKD, 61% regretted their decision to start renal dialysis. Davison’s study identified gaps between current treatment practices and patient preferences for those with CKD. We were impressed by her data and the possibility that a more in-depth communication of prognosis and a more detailed discussion reviewing preferences for treatment planning could improve the routine care of patients with CKD.

The primary goal of our additional nephrology consult “test of change” was to assist patients with CKD, in the ambulatory setting, to make informed treatment planning decisions when their renal function markedly deteriorates. A test of change is a process that examines a small modification in patient care that can lead to a larger refinement when expanded to include a larger patient population. This additional nephrology consult test of change offered an important opportunity to measure whether the early decision-making conversations improved the overall care experience for patients with CKD. These discussions also attempted to help patients more thoroughly understand what it is like to receive dialysis and also to better comprehend the benefits of optimal conservative management without dialysis.

The aim of this test of change was to examine the utility of having an upstream discussion in the ambulatory setting that included introducing the Advance Directive for Health Care and Physician Orders for Life-Sustaining Treatment form. Operational issues affecting the delivery process of the consultation were examined, and statistical metrics were employed to evaluate the effectiveness of the additional nephrology consultation.

METHODS

Analysis of this test of change was approved by the Kaiser Permanente (KP) Southern California institutional review board. All consultations were held in the ambulatory setting and included patients and family members in 2012 and 2013 at KP South Bay Medical Center in Harbor City, CA. All sessions lasted approximately 2 hours. Each test patient had a consultation as part of our test protocol. This test of change used a random-assignment 2-sample test. The selection criteria for patients included age 80 years and older; CKD Stage 4 or Stage 5; one of the following comorbidities malnutrition, dementia, or vascular disease (peripheral vascular disease, coronary artery disease, cerebrovascular disease); or patients referred from their primary nephrologist with a negative response to the surprise question.
“Would you be surprised if this patient dies within the next 6 to 12 months?”

Patients who fit the selection criteria were randomly assigned into 2 groups. The total participants numbered 30: 15 in the test group and 15 in the control group. Another 5 patients declined participation in the test of change. The test group received the additional nephrology consultation; the control group did not receive this consultation.

The additional nephrology consultation consisted first of a thorough case review and medical examination by the test-of-change nephrologist experienced and comfortable with discussing patients’ lived values and comfortable with exploring different treatment trajectories. This was followed by a patient and his/her family meeting with the entire consultation team, which was composed of the test-of-change nephrologist, a social worker, and a clinical ethicist. All consultation team members were the same individuals for the entire test of change. The family meeting included a clinical review of the patient’s short-term and long-term prognosis, questions patient or family members may have voiced, and a review of patient values and lived choices, as well as an introduction to the Advance Directive for Health Care and/or Physician Orders for Life-Sustaining Treatment form. Qualitative statistical analysis included \( \chi^2 \) association between categorical variables, Bayes probability analysis, paired-differences t-test, Z-test, and Spearman rank order correlation (\( p \)). We used a significance level of 10% for our statistical analysis. Our hypothesis was that the data would exhibit a \( p \) value approaching 0.10 because of our small \( n \). We were not confident a more

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Data collection for the qualitative arm of our study continued until saturation. We reviewed the data collected from the questionnaire and identified distinct recurring themes or patterns. Saturation occurred when no new themes or patterns emerged. Our sample size for the test of change was small, but qualitative studies, relying on grounded theory, emphasize the number of themes or categories, not the number of individual participants.\(^4\)

For the quantitative arm of the test of change, both test and control groups received a 6-month follow-up assessment consisting of a review of documentation in the electronic medical record to see if a patient began dialysis, to record the number of hospital admissions, how many bed days were utilized, the number of emergency room visits and clinic visits, and whether the patient had completed an advance directive and/or executed a Physician Orders for Life-Sustaining Treatment form. Quantitative statistical analysis included \( \chi^2 \) association between categorical variables, Bayes probability analysis, paired-differences t-test, Z-test, and Spearman rank order correlation (\( p \)). We used a significance level of 10% for our statistical analysis. Our hypothesis was that the data would exhibit a \( p \) value approaching 0.10 because of our small \( n \). We were not confident a more

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Qualitative data were collected within one week following the consultation using a structured oral questionnaire. Questions were posed by an interviewer other than a member of the test-of-change consultation team (see Sidebar: Structured Questions for examples of the questions posed).

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robust level of confidence (ie, 5%) would be achievable.

RESULTS

Figure 1 shows the results of the qualitative arm of the test of change for the additional nephrology consult. The major iterative themes for the test group responding to the oral questionnaire were that the consult was a helpful experience; the patients felt they had a clear plan after the consult, they favored the meeting format, they had their questions answered, and they felt understood. We also compared the completion of advance directives and/or Physician Orders for Life-Sustaining Treatment forms for the test group (those who received the additional nephrology consult) and for the control group (those who did not receive the test of change, the additional nephrology consultation).

Figure 2 shows that the test group had a higher percentage of completed advance directives and/or Physician Orders for Life-Sustaining Treatment forms than the control group. Although the increased amount of advance directives and/or Physician Orders for Life-Sustaining Treatment forms was encouraging, χ² analysis of our data showed no statistical significance at p < 0.10 (p = 0.27).

Statistical tests were used to analyze the data collected to determine if there was a statistically significant difference between the control group and the test group in dialysis use, hospital admissions, bed days, emergency room visits, and clinic visits. For dialysis use, Bayes probability showed that the control group had a 26% increase in dialysis use, and both the t test and the Z test also showed a statistically significant increase in dialysis use (p < 0.10 for both statistical tools). For hospital admissions, Spearman ρ showed a weak correlation (R = -0.271), and the Z test showed an increase in control group admissions (p < 0.05). When we analyzed bed day use and emergency room visits, the Spearman ρ showed a weak correlation (R = -0.342 and -0.154, respectively). The data collected for clinic visits when analyzed by t test showed an increase in clinic visits in the control group (p < 0.050), and the Spearman ρ showed a weak correlation (R = -0.402). Tables 1 and 2 detail all quantitative results.

DISCUSSION

Our test-of-change pilot study attempted to review the utility of providing an upstream discussion in the ambulatory setting for renal patients considering treatment plan decision making. It has been noted that treatment planning conversations must present "a clear understanding of the limits and possibilities of medicine and realize this understanding to be more of a process and not an epiphany." 5 We believe this process is important for patients who need to clarify treatment goals in settings where more intense treatment options, such as commencing dialysis, may be a possible outcome of CKD. Interdisciplinary consultations in the ambulatory setting allow us to begin a conversation that can include helping patients and families better understand the possibilities of medicine, patients' treatment goals, and lived values from the patients' context. 7 Documentation of this conversation in the patient's electronic medical record serves as a future reference.

CONCLUSION

The analysis described in this article showed that for a small cohort of patients, an additional nephrology consultation test of change proved helpful both qualitatively and quantitatively. It would be important to expand the test-of-change intervention to include a larger number of patients. When statisticians introduced ways of thinking about data, such as p values introduced by Ronald Fisher in the 1920s, tools of statistical analysis were seen as an informal way to judge whether evidence was worthy of a second look. We recommend that our work should be seen as Part 1 in a 2-stage analysis, and a second look should be seriously considered. 89 Our exploratory test of change and data analysis gathered interesting and helpful findings. In the future, we encourage larger, more rigorous studies to be undertaken in this area.

Table 1. Quantitative analysis for control group

<table>
<thead>
<tr>
<th>Measure</th>
<th>t test</th>
<th>Spearman p*</th>
<th>Z test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dialysis</td>
<td>Increase in control group (p &lt; 0.10)</td>
<td>Unable to calculate correlation</td>
<td>Increase in control group (p &lt; 0.10)</td>
</tr>
<tr>
<td>Admissions</td>
<td>Increase in control group (p &gt; 0.10)</td>
<td>Weak correlation (R = -0.271)</td>
<td>Increase in control group (p &lt; 0.05)</td>
</tr>
<tr>
<td>Bed day use</td>
<td>Increase in control group (p &gt; 0.10)</td>
<td>Weak correlation (R = -0.342)</td>
<td>Increase in control group (p &gt; 0.10)</td>
</tr>
<tr>
<td>Emergency room visits</td>
<td>Increase in control group (p &gt; 0.10)</td>
<td>Weak correlation (R = -0.154)</td>
<td>Increase in control group (p &gt; 0.10)</td>
</tr>
<tr>
<td>Clinic visits</td>
<td>Increase in control group (p &lt; 0.05)</td>
<td>Weak correlation (R = -0.402)</td>
<td>Increase in control group (p &gt; 0.10)</td>
</tr>
</tbody>
</table>

* For Spearman rank order correlation (ρ), the sign of the coefficient indicates the direction of the relationship; if one variable tends to increase as the other decreases, the coefficient is negative. Statistical significance is p < 0.10.

* Patients in the control group had a 26% increased probability of beginning dialysis, when data were analyzed by Bayes probability.

Table 2. Data on outcomes in control and test groups

<table>
<thead>
<tr>
<th>Measure</th>
<th>Control (no. of patients)</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dialysis</td>
<td>2.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Admissions</td>
<td>0.5</td>
<td>0.2</td>
</tr>
<tr>
<td>Bed day use</td>
<td>2.8</td>
<td>0.5</td>
</tr>
<tr>
<td>Emergency room visits</td>
<td>0.73</td>
<td>0.66</td>
</tr>
<tr>
<td>Clinic visits</td>
<td>6.6</td>
<td>3.6</td>
</tr>
</tbody>
</table>

* Data are expressed as number per patient except for dialysis.

Disclosure Statement

The author(s) have no conflicts of interest to disclose.
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References

A True Impression
A straight answer does not mean for me what is often called the “blunt truth,” the “naked truth,” the dry cold facts. The truth that I mean is a true impression, a fully drawn and properly shaded account such as is, as I well know, very difficult to give … But better than either a misleading half truth or a pleasing lie, is an attempt to answer the patient’s question that he shall see not only what he can’t do and can’t hope for, but what he can do and what there is to work for hopefully.

— Richard C Cabot, MD, 1868-1939, American physician