Adherence in Kidney Transplant Recipients

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In their article in this issue, Taber et al. [1], examine the role of appointment non-adherence in graft outcomes in kidney transplantation. They find that appointment non-adherence is a significant and independent predictor of negative outcome beyond medication non-adherence. This is particularly significant as the domains of requisite adherence for kidney transplant patients have not been clearly delineated, and certainly the minimum requisite compliance for prevention of deleterious consequences has not been determined. Patients with end-stage renal disease (ESRD) who are treated with hemodialysis have a more defined set of behaviors required for optimal health [2]. Medication compliance, treatment adherence, and diet and fluid adherence have all been associated with outcome [3]. The importance of these particular domains, or others, have not yet been sufficiently tested or demonstrated for ESRD patients who have received a kidney transplant. The data presented by Taber et al. [1] clearly suggest that our model of requisite behaviors for kidney transplant patients needs to extend beyond medication taking, and include, at least, appointment adherence as well.

The inter-relatedness of behaviors across adherence domains is also poorly understood. It is not known if patients who are adherent for a particular behavior are generally more adherent across all behavioral domains, or if people are more likely to be adherent in some domains and less adherent in others. Furthermore, it is unclear if patients are consistently adherent in a single domain. For example, it is unknown if patients' medication taking be-

havior is consistent across the different medications prescribed. Similarly, it is unclear how unitary a measure dietary adherence is. Are non-adherent patients non-adherent to the full range of their dietary recommendations? Are they likely to have some recommendations they more consistently follow than others, or is there a time course, or cyclical nature to their dietary compliance? The consistency of adherence behaviors within and across domains of the behavioral prescription has not been nearly sufficiently explored. Similarly, the impact of non-compliance across domains is poorly understood. Non-adherence may be considered to be additive or possibly synergistic, as being non-adherent across multiple domains may place a patient at an incremental increased risk of negative outcome.

Related to the issue of defining the scope of adherence in particular populations is the best strategies for its measurement. Perhaps a primary reason that adherence research lags behind other areas are the methodological challenges of defining and measuring adherence behaviors accurately. While a broad range of outcome measures have been utilized for medication non-adherence including self report, refill records, pill counts, medication monitoring caps, and more recently smart pill boxes, all of these strategies have significant methodological limitations and none truly measure actual medication taking, but some proxy. For the field of adherence research to progress, improved reliability and validity are needed in the outcome measures, in addition to a more comprehensive understanding of the relationships between the domains of adherence.

In trying to understand motivation across a wide range of behaviors, it seems reasonable to consider human conditions that would impact motivation in general, beyond the specific challenges of each behavior. Depression has been identified as a significant predictor of non-adherence in medical populations in general [4], and in kidney transplant populations, in specific [5]. Depression, and its associated demoralization, can be related to the cause and consequence of medical illness, but regardless of etiology, depression can greatly impair adherence across all behavioral domains. There is encouraging evidence that treating depression can have positive consequences on adherence behaviors [6]. We found that an intervention that targeted depressive affect was also successful at improving fluid compliance, even though it was not expressly targeted in the intervention.

While improving depression may translate into improved adherence across broad domains, more research is

needed to determine if targeting specific components of adherence non-compliance can be successful. We have recently demonstrated that cognitive behavioral strategies may be useful in improving medication adherence in immunosuppressant-non-adherent kidney transplant patients [7]. The applicability of this conceptual approach to the other domains of behavioral compliance needs to be demonstrated.

Defining the requisite adherence behaviors for kidney transplant recipients and testing novel strategies for their meaningful measurement are the next steps in the development of prospective intervention. Once we have an understanding of the most salient adherence behaviors, we will be able to appropriately direct research intervention efforts.

Disclosure Statement

The authors have no conflicts to declare.

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