

## **Nonadherence to immunosuppressive therapy in kidney transplant recipients**

End-stage kidney disease (ESKD) is an increasing worldwide illness that compels patients to accept either dialysis or kidney transplantation that is the best choice because ensures high quality of life. But, living or cadaveric kidney donation is not enough to transplant all ESKD patients in waiting list. For this reason, when a patient receives the renal graft it is necessary to maintain the kidney functioning for all the life. But, this is not true because patients have often inadequate adherence to the immunosuppressive therapy. Therefore, monitoring adherence should be part of the patient care program after kidney transplantation.

This review illustrates the current technologies -traditional or emerging tools- that can help the healthcare providers to monitor the medication adherence.

Adherence, previously referred as compliance, is related to many factors like patient's condition, treatment, healthcare system and socioeconomic aspects. The goal of the healthcare providers is to identify patients who are partially or non adherent to the therapy.

The measurement of the adherence may be direct or indirect. The direct measure consists of the evaluation of drug level in the blood, while indirect methods include self-report questionnaires and scales, pill counts, medication refill rates obtained by the pharmacy, clinical outcome or electronic medication monitoring. At present, there is no reliable method for measuring treatment adherence without bias.

The medication event monitoring systems (MEMs) are generally considered the gold standard for measuring adherence because these technologies have superior sensitivity compared with the above-mentioned approaches. MEMs are tools that use pill bottles with a small electronic processor recording the date and time of every cup opening. However, these systems have some limitations, ie they do not measure that patient swallows the pills or takes the correct dose every time or he/she opens the bottle of drugs.

The more recent introduction of interactive voice response systems (IVRS), integrated with the new field of electronic health (e health) have shown that different technologies (ie, telecalling, text messaging, online communication, electronic forums, and electronic pill dispensers) can improve the adherence to medications. A clear advantage of IVRS is their ubiquity, because mobile phones and other devices are extremely widespread. The IVRS offer some advantages that can improve access to health care and outcomes. In addition, they are based on widespread and simple technologies with low cost and very effective telehealth application. They are of particular support for outpatients and for those living in rural areas. The current availability of IVRS tools and mobile-phone monitored health can positively improve the therapeutic adherence to immunosuppressive therapy in individuals with renal graft. The strict medical follow-up of these patients still remain a

crucial part of caring because nonadherence can have devastating consequences on graft and patient survival. In addition to the clinical complications, the economic consequences are worrisome.

The cost of patients with inadequate adherence is three times higher than that of patients with excellent adherence. Therefore, patients with high risk for future non adherence, like adolescents, teenagers, individuals with anxiety or depression, elderly patients should be monitored after transplantation.

The increasing frequency of antidonor antibodies in the blood of patients with renal graft is a stimulating area of interest for monitoring the adherence to immunosuppressive therapy and to reduce the devastating consequences firstly for the graft and then for the patient.

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