



Comparing Quality of Life After APCEDEN® & Conventional Therapy

SEPTEMBER 2019, EDITION 2, VOLUME XIX.II

Cancer is potentially life-threatening disease that often leads people to question the value of life and importance of good healthcare. In several cases, patients are often diagnosed at a very late stage while they are experiencing the symptoms associated with it. Even today, the standard treatment regime comprises of surgical resection followed by chemotherapy and radiotherapy. The ailment tends to leave a physical, social and a financial impact on the patient's life. Whether patients are newly diagnosed, a long-term survivor or still in active treatment, cancer affects them inside and out. Even after huge expenditure on conventional regime, the chances of survival remain unclear. Although tailored/personalized treatments are available, they have not yet been widely adopted. Quality of life (QOL) is a major concern for patients with cancer. Side effects affect their QOL and management of symptoms improves distress and QOL.

QOL describes the overall well-being, including:

- Mental and physical health
- Ability to perform daily roles
- Sexual function
- Pain, fatigue and other side effects of treatment or symptoms of the disease

Non-health issues (such as financial concerns) are also part of quality of life.

Managing side effects and other issues that reduce QOL is an important part of cancer care. Although

most cancer survivors initially report a good quality of life, they may have some long-term side effects from conventional treatment. In most of the cases, the QOL does not seem to improve spontaneously after the conventional treatment. There is an urgent need to develop measures for effective management of symptoms and to improve the QOL.

In the last 2 decades, immunotherapy has been widely recommended to patients post conventional therapy. The term Immunotherapy is broad that encompasses checkpoint inhibitors, monoclonal antibodies and CAR-T cell therapy reflecting individual patient's needs. It also comprises of Dendritic Cell (DC) based immunotherapy, an autologous treatment which is specifically designed as per the individual biomarkers.

Physical and Mental Wellbeing-

Besides medical history, patient's immune assessment, Functional Assessment of Cancer Therapy-General (FACT-G) and Eastern Cooperative Oncology Group (ECOG) status is monitored and assessed before enrolling patients for APCEDEN® based immunotherapy. APCEDEN® is an autologous (patient derived) Dendritic cell-based immunotherapy that has been approved by the Government of India for 4 indications of cancer (Prostate, Ovarian, Colorectal and Lung).



FACT-G is a 5-minute medical survey that comprises of a list of questions that assesses the impacts of cancer therapy in four domains: physical, social/family, emotional, and functional. Like FACT-G, ECOG allows us to grade patients enrolled for the therapy and assess their QOL. Since the majority of patients enrolled for DC immunotherapy are refractory cases with multiple chemo failures, they exhibit a poor QOL based on FACT-G and ECOG status. The survey is conducted during and post treatment to track patient's physical and mental wellbeing.

Although some patients receive a disease-free status post conventional therapy, every patient tends to experience a severe discomfort along with loss of appetite and physical activity. They fail to perform day to day work independently and thus confine themselves to bed. Since APCEDEN® is a patient derived specific treatment, an improved FACT-G and ECOG status has been reported post therapy. A significant improvement has been observed among patients in terms of their physical and mental behaviour. Moreover, an increased appetite along with ability to work, walk and travel has been reported among patients post APCEDEN® treatment.

Immune Assessment-

Besides physical and mental fitness, QOL also defines immunity of an individual to mount an effective immune response against cancer. Immune assessment is actively monitored from the day of enrolment to track immune progression. The assessment is being followed and monitored after alternate dosage. Also, a post treatment follow-up comprises of analysing cancer progression along with studying immune assessment. This includes quantification of parameters such as T-reg, IFN-gamma (γ),

Neutrophil-Lymphocyte Ratio (NLR) and Platelet Lymphocyte Ratio (PLR) via ELISA, Q-PCR and Flow cytometry.

T-reg cell population shares a close association with cancer progression. A low T-reg population defines better immune response along with reduced risk of cancer progression.

IFN- γ is a 17kDa factor produced by activated T and NK cells and is an anti-viral and anti-parasitic cytokine. IFN gamma in synergy with other cytokines, such as TNF alpha, inhibits proliferation of normal and transformed cells. Immunomodulatory effects of IFN gamma are exerted on a wide range of cell types expressing the high affinity receptors for IFN gamma.

NLR is considered an efficient marker of cancer and is calculated by dividing the number of neutrophils by number of lymphocytes, usually from peripheral blood sample. PLR is considered to indicate prognosis in inflammation related to malignancies. Changes in this ratio associate with important clinical outcomes including overall survival, progression free survival and clinical response in advanced cancer patients treated with immunotherapy and therefore may have a valuable role in selecting patients most likely or least likely to benefit from treatment, or for monitoring response to treatment over time.

Since chemotherapy tends to shrink and kill cancer cells, it fails to boost a memory response against the tumor antigen. Therefore, no immune assessment could be performed except tracking cancer progression post completion of chemotherapy. On the other hand, APCEDEN® tends to develop an effector memory response gradually against the tumor antigen, thus an immune assessment allows us to not only track cancer progression but also T cell level and

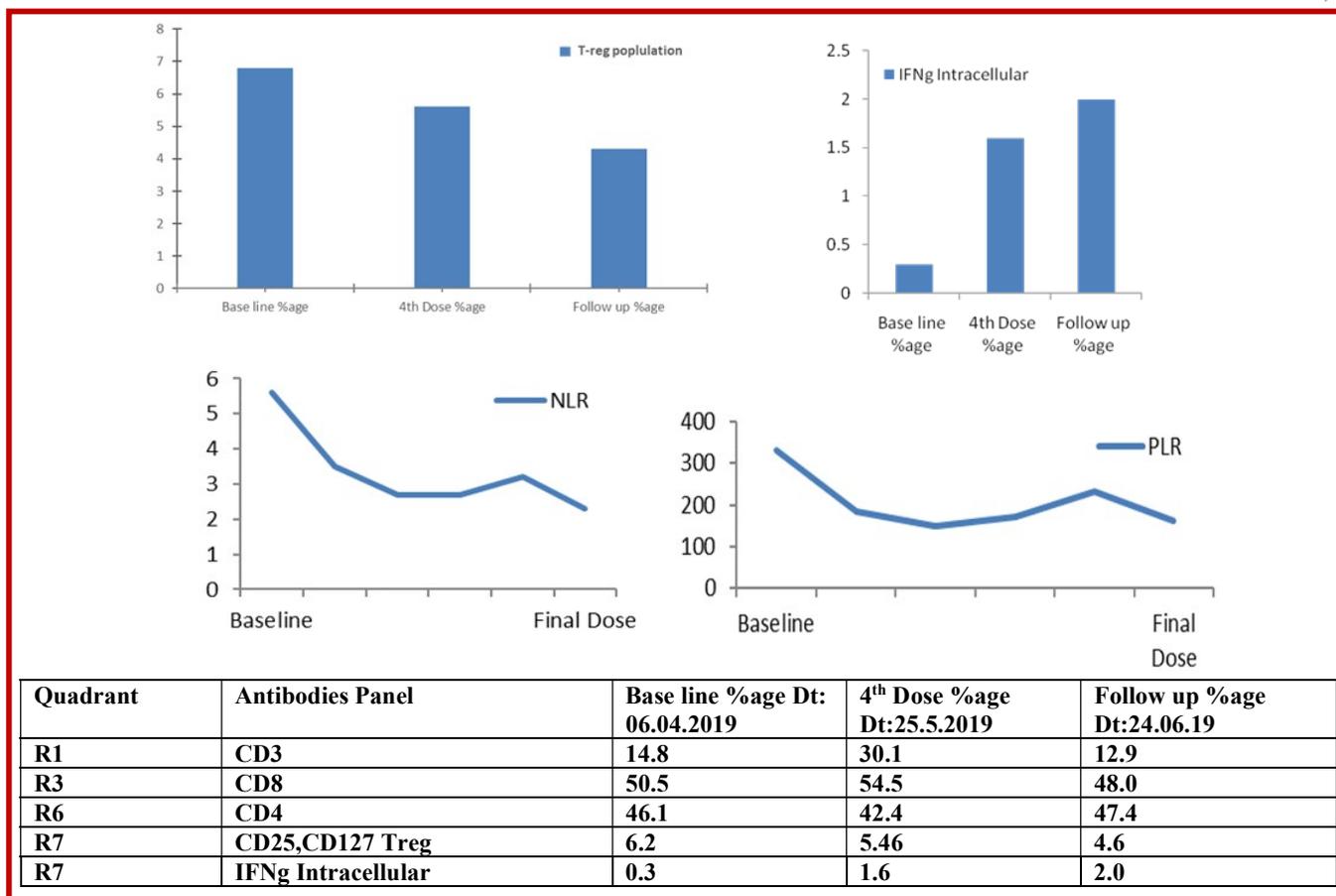


Figure 1: Immune Assessment performed on a patient at several time points of APCEDEN® treatment.

cytokine production against tumor antigen (Figure 1).

Re-administration of Therapy-

The first line of defence for every cancer is conventional therapy. The therapy is often stopped after some time and patients are not advised to undergo chemotherapy throughout their life. Unlike conventional therapy, APCEDEN® could be prescribed to patients anytime of the treatment regime. Being an autologous treatment, patients can undergo this set of treatment their entire lifespan without experiencing any side effects onto their system.

Overall Survival & Economic Growth-

Overall survival also defines the QOL among cancer patients. Although cancer tends to steal away survival time, science has made significant efforts in restoring and extending the survival benefit. Several clinical and scientific publications have emphasized greatly on the benefits of administering patients DC immunotherapy subsequently or in parallel to chemotherapy. These trails have reported a significant increase in an overall survival among patients compared to the untreated group. This helps in reducing mortality rates. Since it improves the physical and mental behaviour of the patient, it helps in reducing the economic burden on the global healthcare system and breeds social development.