GENERAL ARTICLE

APPLICATION OF FLOW CYTOMETRY IN PEDIATRIC HEMATOLOGY / ONCOLOGY

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Abstract: *Flow cytometry (FC) is a laser-based technology which is used to detect and measure physical and chemical characteristics of a population of cells or particles. It is a tool for rapid analysis, where thousands of cells can be quickly examined and processed by a computer. It is highly useful in the study of immune dysfunction and hematological malignancies. In the last 60 years, millions of HIV infected patients in resource poor environments are living longer through therapy management guided by flow cytometry. It is also useful in the diagnosis of many rare but benign illness like paroxysmal nocturnal hemoglobinuria. Great benefit of flow cytometry is the ability to test large number of cells in a short time. It has lot of applications in diagnostics and recently flow cytometry assays have been developed to identify parasites such as cryptosporidium and giardia. This article covers the principles of flow cytometry - Optics, Fluidics ad Dynamics, its diagnostic applications and limitations in present use.*

Keywords: *Hematological malignancy, Minimal residual disease, Immune deficiency.*

Points to Remember

- *Flow cytometry analyses various qualitative and quantitative characteristics of a cell, such as cell size and cellular contents.*

- *Though the mechanism is complex, it has wide application in the diagnosis of various hematological conditions ranging from benign disorders like fetal maternal hemorrhage to malignancy and immune deficiency.*

- *Identification odf minimal residual diseases plays a major role in the management of children with leukemia.*

- *Flow cytometry also helps in identifying prognostic markers and markers for therapeutic use, such as use of rituximab in tumor cells expressing CD 20.*

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