INTERFERON-ALPHA IN PEDIATRIC ONCOLOGY

Dr. Szegedi István

DE OEC Gyermekklinika

Cancer is one of the most important factor of childhood mortality. Despite of recent advences, 20-30% of children with cancer still succumb to death due to their disease even in the 21st century. Promising results were obtained with biologic response modofiers which enhance anti-cancer defense mechanismus of the body and may help to reverse disturbed differentiation/maturation processes. Interferon-alpha (IFNα) is a well studied representative of biologic response modifiers however, its role in the pediatric oncology remains to be established.

I have performed a literature survey on anti-tumor effects and application of type-I interferons with a particular emphasis on rare childhood myeloproliferative disorders. Effects on proliferation and differentiation of IFNα were studied in vitro using leukemia/lymphoma cell lines of the B-cell lineage, umbilical cord blood-derived B-lymphocytes and bone marrow-derived mononuclear cells of a pediatric patient with essential thrombocythemia (ET). I have assessed the therapeutic application of IFNα in children with advenced cancer, associated with particularly unfavourable outcome.

IFNα has exerted a significant, dose-dependent inhibition both in primary and secondary colony formation of three leukemia/lymphoma cell lines of the B-cell lineage. The drug has enhanced, in parallel, programmed cell death. In contrast to leukemia/lymphoma cell lines however, IFNα has prevented spontaneous in vitro apoptosis in cord blood derived healty B-lymphocytes. In parallel with the roboust inhibition of clonal proliferation of myeloid progenitor cells, IFNα treatment resulted in a long-lasting partial remission in a child with ET. In addition, 14/24 children with advanced cancer exhibited a favorable therapeutic response (CR or PR) upon IFNα treatment. The mild side effects, observed in most cases, allow the safe application of IFNα in pediatric patients. Severe complication, in form of Sweet syndrome, was observed only in two patients receiving IFNα therapy in combination with isotretinoin.

These results, together with the observations of other groups suggest, that IFNα is a promising agent in certain forms of childhood cancer.