Significance of dna study in families of leukemic children

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-169-SUMMARYAcute lymphoblastic leukemia is the most common malignant diseaseaffecting children, accounting for approximately 30% of childhood cancers.Before the advent of effective chemotherapy, ALL usually was fatal. Withfurther progress of chemotherapy, the incidence of children whom they interin complete remission increased.Further progress in the treatment of ALL depends on the developmentof new techniques for identification of certain factors that affect prognosis ofthe disease. Patients with unfavorable clinical and laboratory features wereconsidered high risk patients and intensive therapeutic strategies should beconsidered.One of the most recent and important prognostic factors in estimatingthe prognosis was the chromosomal study of ALL patients.Familial aggregation of leukemia has been noticed. Also the risk ofleukemia in sibling of children with leukemia has been estimated to be morethan that of normal population.TIllS prospective trial was conducted to study ~ Egyp--ti=an ALLpatients. A standard epidimiologic data on all patients and cytogeneticanalysis in the form of karyotypic study was performed. Also our studyincluded the examination of the healthy members ofthe family of the affectedchildren.-170-Adequate examination was applied for each patient including completehistory and physical examination, chest X ray, Abdominal sonography,complete blood count, bone marrow examination and karyotypic study.Out of the 30 cases studied, successful karyotype was performed in 22cases. These 22 cases were classified into two groups; group I (group ofgood prognosis) and /:,'TOUp2 (group of bad prognosis). The prognosis wasevaluated according to the follow-up for one year after initiation of treatment.Group 1 (group of good prognosis) implied 11 cases, 10 ofthem were ofnormal karyotype and one case was hyperdiploid > 50 chromosome. Group2 (group of bad prognosis) implied II cases two of them were hyperdiploid(from 46-49 chromosomes), two cases were hypodiploid and the remainingwere of normal diploid number. We recorded 6 cases with translocationswhich were considered to be the most common structural chromosomalabnormality. Only one case had deletion and it was in the short arm ofchromosome 9. A strong relation was found between chromosomalabnormalities, especially translocations, and bad prognosis.Normal chromosomal pattems were recorded m the all healthymembers of the leukemia children's families.-171-CONCLUSION AND RECOMENDATIONConclusion:(1) The presence of any chromosomal abnormality IS an indicatormainly of bad prognosis in all patients.(2) Translocation is the most

worse type of chromosomal abnormalityas a landmark of prognosis. The specific fonn of translocation, the ph + veALL patient also had poor treatment outcome.(3) Hypodiploidy is associated also with poor therapy outcome.(4) Hyperdiploidy (47 - 49) and pseudodiploidy cases have relatively poorprognosis.(5) Patients with apparantly normal chromosome have relatively goodprognosis.(6) Hyperdiploid > 50 is the only chromosomal abnormality, detectedin our study, which has relatively good prognosis.(7) There is no chromosomal abnormalities in the healthy members ofleukemic children's families.-172- rRecomkndations:(1) Cytogenetic analysis should be done to every leukemic children atdiagnosis and also at relapse (if it occured).(2) If any chromosomal abnormality was detected (especiallytranslocation), intensive chemotherapy program and bone marrowtransplantation should be considered as therapeutic options.(3) Cytogenetic analysis should be considered as one ofthe proceduresdone in routine follow up for ALL children together with the ordinary bonemarrow examination and pripheral blood picture.(4) Further follow up to the healthy members ofleukemic children'sfamilies is recomended. This follow up must be performed for a long periodas these members may develop leukemia later on.(5) Concerning the technique of cytogenetic analysis, we recomendcertain modification in the ordinary karyotypic study. This modification giveus a better results.Four samples will taken from the patients and incubationwith growth media is performed for different times. In bone marrow the firstsample should be analysed directly, the second after 24 hours, the thirdafter 48 hours and the fourth after 72 hours. In pripheral blood the firstsample should be analysed after 24 hours, the second after 48 hours, the thirdafter 72 hoursand the fourth after 120 hours Wheareas these four sampleswere practically difficult to be taken from an ill child (as we had to obtainfour bone marrow samples),-/73-We hope to use an advanced technique in cytogenetic analysis in ALLchildren, that is the high resolution banding technique. It is a well proven factthat this approach has provided a more accurate diagnosis of chromosomaldefect in human. This technique will provide us with a less condensedchromosome. The advantage of the elongated chromosome is that they canvisualise fmer details with large number of bands.(6) Cytogenetic analysis team should be in available in every hospitalor centr dealing with leukemia.