Hematology & Oncology Abstracts

Radionuclide therapy in pediatric malignancies

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The following article aims to provide contemporary information on therapeutic nuclear medicine. Neuroblastoma is the most common malignancies among pediatric malignancies. Pediatric extra cranial solid cancer characterized by meta-iodobenzylguanidine (MIBG) avidity in =>90% of patients. There exists approximately a 30-year experience with I-131-MIBG treatment. Neuroendocrine tumors (NETs) are very rare neoplasms in the paediatric population accounting for <1% of all pediatric malignancies. These neoplasms are characterized by the presence of neuroamine uptake mechanisms and/or peptide receptors at the cell membrane. These features constitute the basis of the clinical use of peptide receptor In radionuclide therapy (PRRNT) using radiolabeled somatostatin analogues. Patients with chemoresistant CNS acute lymphoblastic leukemia (ALL) require carniospinal radiotherapy which is assossiated with major toxicities including growth and learning disorders in young children. Radioimmunotherapy with I131-labeled anti-CD10 and anti-CD19 mAbs administered intrathechally is associated with clearing of the cerebrospinal fluid lymphoblasts. Osteosarcoma is the most common primary bone tumor in children usually treated with chemotherapy and surgery. In palliative situations bone seeking radionuclide therapies (strontium-89 [Sr-89], rhenium-186 hydroxyethylene diphosphonate [Rh-186 HEDP] and Samarium-153-ethylene diamine tetramethylene phosphonic acid [Sm-153-EDTMP]) may be offered to patients with painful metastatic osteosarcoma or in case of recurrent bone sites inaccessible to local therapies (surgery, external irradiation). Thyroid cancer is a rare childhood malignancy but is the most frequent tumor of endocrine glands in children and adolescents. Management includes radioiodine therapy, but there are some distinct differences in comparison to adult thyroid cancer management.

Keywords: Radionuclide Therapy, Pediatric Malignancies, Nuclear Medicine

The results of treatment of retinoblastoma in children

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Background: Retinoblastoma intraocular malignant tumor, which can occur at any age, but more often diagnosed in children under 2 years. Among all malignant tumours at children RB accounts for about 3% of cases. Overall survival for various literary data ranges from 90 to 95%. Patients with extensive-stage disease, including interstitial RB do not receive adequate treatment. Extremely poor prognosis in patients with extraocular the spread of the RB dictates the necessity of creation of adequate therapy. The aim of the study was to determine the effectiveness of therapy adapted accordingly risk in 17 patients with retinoblastoma.

Methods: The study included 12 primary patients with locally common, extraocular metastatic RB and 5 patients with relapses of the RB after the enucleation of the eyeball. The program of treatment depending on the risk groups include surgery, radiation therapy (RT), or intensive polychemotherapy. In 2013-2014, 17 children (boy-7, girls-10) aged to 6 years were observed.

Findings: After diagnostic study, which included clinical examination, x-ray, ultrasound, CT and MRI of orbit, one-sided retinoblastoma (ORB) was diagnosed in 16 (94%), and bilateral BR (BRB) in 1 (5%) patients. In the high-risk group, RB included 6 children: one of them with BRB and other five with ORB. In the group of medium risk RB included 10 patients, and one patient with standard RB risk. In the group of patients, in 2 patients (11%) retinoblastoma were detected at stage I, in 5 patients (29%) at stage II, in 6 patients (35%) at stage III, and in 4 patients (23%) at stage IV. Multiple metastases were observed in 35% of children in the form of a lesion in the bone marrow, central nervous system, parotid salivary glands, the skull bones or liver. Hardcore metastases were observed in the form of a lesion of the bone marrow. In 5 patients (29 %) relapse occured. 14 patients received protocol therapy, and 3 patients refused treatment. On the scheme "chemotherapy (CT) + enucleation + CT" were 6 patients and "enucleation + CT" included 8 patients. 9 patients received Chemotherapy Protocol RBA-2003: two blocks of CT was received by 55% (5) patients, 25%(2) of children received 4 block of chemotherapy and 25%(2) received 5-6 blocks, CT and Protocol JCE/JOE were received by 5 patients: 60% (3) patients had 2 block of chemotherapy, 15%(1) had 3 block of chemotherapy, 15%(1) had 6 blocks of CT. In our work, all patients underwent surgical treatment of residual method enucleation and subperiosteal one essentialy in orbit. The possibility of disease progression in the central nervous system in patients with retrolental invasion of the optic nerve gave the right to recommend RT included 4 (23%) patients. Causes of disease progression in the central nervous system in 6 patients (35%) included tumor invasion of the optic nerve to the line resection and extraocular extension of tumor to retro-bulbar fibre and extraocular muscles. Among the complications of risk-adapted therapy for children with ORB after primary eye enucleation, it should be noted hematologic toxicity identified in 88.5% of cases, which required the application of an adequate supporting therapy.

Conclusion: Out of 14 patients, which received program chemotherapy, 64% (9) children are in remission. For 3 of them child-treatment continued, 1 child received autologous transplantation of bone marrow, 5 graduated from the PCT; the average duration of the observation was 10 months. 36% (5) of patients experienced the progression of the disease, included one death. Of late-diagnosed with retinoblastoma, 60% of children entered 3-4 stage of the process. High-dose chemotherapy is the only effective method of treatment of metastatic retinoblastoma, allowing to achieve long-term remission. Transplantation of autologous stem cells is effective for the treatment of children in the absence of the primary lesion of the Central nervous system.

Keywords: Retinoblastoma, Treatment, Chemoterapy

The efficacy of recombinant human erythropoietin in treatment of chemotherapy-induced anemia in children

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Background: Anemia is a frequent complaint during intensive chemotherapy in children with cancer. Recombinant human erythropoietin (rHuEPO) treatment can increase hemoglobin levels, decreased transfusion requirements, and improve quality of life in patients with cancer.The aim of this study posed a decrease in blood transfusions and an increase of hemoglobin levels in patients receiving rHuEPO for 12 weeks.
Methods: This was a randomized clinical trial. Participants were 60 patients aged<15 years with anemia and diagnosis of solid tumor between February 2013 and March 2014. 29 Patients received 150 IU/kg/dose rHuEPO subcutaneously, 3 times a week, for 12 weeks. All patients had blood tests every week to determine complete blood count. Number of patients receiving transfusion during the treatment period was compared in the following 12 weeks.
Findings: There was a significant decrease in transfusion requirements in the rHuEPO receiving group. 5 patients (17.2%) in the rHuEPO group needed a blood transfusion, whereas 15 patients (53.6%) needed a transfusion in the control group. Increase in hemoglobin levels, began from the 5th to 6th week, and continued to the end with an ascending trend in the rHuEPO group. There was no significant difference in hemoglobin levels before and after study in CDDP regimens and non-CDDP regimens in the both groups. There was no significant difference in mean hemoglobin before and after the study in the patients receiving G-CSF and non-G-CSF receiving in the participating patients. rHuEPO caused hypertension in one patient at 4th week that stopped the treatment.
Conclusion: rHuEPO (150 IU/kg/day, 3 times a week) is effective in increasing hemoglobin levels and also decreasing blood transfusion requirements in children with anemia following intensive chemotherapy. As a result, this study recommends using of rHuEPO in treatment of chemotherapy-induced anemia in children with solid tumor.
Keywords: Recombinant Human Erythropoietin, Anemia, Chemotherapy

Evaluation of soluble transferrin receptors in children with iron deficiency anemia

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Background: Iron deficiency anemia is one of the most common nutritional deficiencies and public health around the world. The growing children are one of groups that are at high risk for this problem. So early diagnosis and treatment can prevent great side effects. One of the diagnosis means is measuring of soluble tranferrin receptor level (sTfR) in serum because level of this receptor increase in result of iron depletion but has no change in anaemia of chronic disease or inflammation.
Methods: This was a case control study included 64 children with iron deficiency anemia (IDA) and healthy subjects.The study conducted in 2008-2010 in Children's Medical Center. Hb, MCV, Fe, Ferritin, TIBC and sTfR were measured in both groups.
Findings: Compared to the control group, serum sTfR mean level was significantly higher in children with IDA than control group (1.87 vs. 1.06 µg/ml, P<0.002). sTfR showed negative correlations with Hb (r=-0.629, p<0.001), MCV (r=-0.649, p<0.001) and serum Ferritin (r=-0.224, p<0.053), although it was not significant for Ferritin. There was no significant differences between cases and controls in sTfR mean level with regard to gender and age categories.
Conclusion: This study shows sTfR level can be an appropriate biomarker for diagnosis of IDA, particularly in patient with IDA coexisting with inflammation.
Keywords: Soluble Transferrin Receptor, Iron Deficiency Anemia, Children

The use of intravenous immunoglobulin in pediatric oncohematological practice

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Background: Presence of infectious complications in oncohematological patients significantly complicates treatment and worsens the prognosis of the underlying disease. In such situations immunoglobulin (IVIG) is applied. The aim of our study was to examine the efficiency of the use of IVIG in 67 children with oncohematological pathology.
Methods: IVIG for the treatment of purulent-septic complications (neutropenia) used in patients with ALL - 47%(32), AML - 40%(26), histiocytosis 3% -(2), AA - 6%(4), MDS -3% (2) and PID is -1 (1,4%), were administered a single dose of 0.2 g/kg/day, daily 1 per day, duration ranged from 1 to 7 days. The effectiveness of the drug in patients with oncohematological pathology with infectious complications was estimated on the normalization of body temperature, the results of the general analysis of peripheral blood, the general analysis of urine, triple culture of blood.
Findings: Patients receiving of IVIG due to the presence of infectious complications were at various stages of therapy. Patients with acute lymphoblast leukemia received therapy program ALL-BFM-2002; patients with c myeloblastic leukemia (CML) received therapy program AML-BFM-2004; patients with Langerhans LCH-III or aplastic anemia received immunosuppressive therapy. Infectious complications in the study patients included sepsis, which took place in the form of sepsis without localized foci of infection in 15.3%, septicemia in 2.6%, sepsis with septicopyemia in 10.2%, and febrile neutropenia in 78.6%. Localization panicucci foci include bacterial carditis in 2.8%, ulcero-necrotic colitis in 8.5%, pneumonia in - 10.8%, and necrotic lesions disease in 20.8%. The extension of infection occurred at the background of deep cytopenia-neutropenia (leukocytes less than 1 × 109, granulocytes less than 0,h). Microbial landscape of the patients was presented in 78.4% of the cases as gram-positive microorganisms and in 21.6% as gram-negative microorganisms. From blood of patients, gram-positive pathogens was seen in 55%. Among them the most

oftenorganisms was Staphyloccocus aureus in 71.2%, Streptococcus Epidermidis in 66.7%, and Streptococcus in 67,5%. Among fungal infection Candida (36.4%), Peniccillium (31.8%), Mucor (22.7%), and Aspergilius (9.1%) were seen. Mushrooms more often were detected from the blood (72.6%) than from other sources of infection. The markers to the virus Abstain-Barr (EBV) were seropositive in 48.9% of children, of Herpes virus in 93.3% of children, and of cytomegalovirus (CMV) from 80.2%. The dynamics of the temperature reaction was the following: the initial temperature of 38.4±of 0.36 Degrees; it was normalized after 1 day from the beginning of introduction of IGW treatment, in 18 patients (26%), within 3 days from the introduction of IGW in 25 patients (39%), within 5-7 days in 17 patients (25%), and was inefficient in 7 (10%) cases among whom were patients with progression of the underlying disease, recurrence ALL (1 case) and AML (2 cases), one patient with myelodysplastic resistant to therapy with manifestations of fungal sepsis not having achieved remission.
Conclusion: Use of immunoglobulin in complex therapy of oncohematological patients, in the period of agranulocytosis has allowed to achieve improvement in 92.3% of cases, decreased the incidence and severity of infectious complications, achieved more rapid recovery of hemopoiesis, accelerated normalization of blood, and reducing interruptions in the treatment course.
Keywords: Immunoglobulin, Oncohematology, IVIg

Comparing the heart iron deposition status measured by MRI T2* with the echocardiography findings in major β-thalassemia patients

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Background: Excessive iron store of transfusion causes many complications in major β thalassemia patients. In this study, the relation among iron deposition status reported by the heart MRI T2* technique and ejection fraction and the heart structural changes in major β thalassemia patients is considered.
Methods: 52 patients with major β thalassemia, aged 7 to 29 years old, were studied. The heart MRI T2* scan and echocardiography were taken from the patients. Thereafter, the iron deposition status reported by the heart MRI T2* technique was compared with echocardiography results. The collected data were statistically analyzed by SPSS software.
Findings: 44.2% of the patients were females and 55.8% were males with averagely 17 years old. The mean of packed cell transfusion was between 150-180 cc/kg. Average of relaxation time and ejection fraction were 26.59 ms and 65%. 43 patients had normal echocardiography and 9 patients had some degrees of the cardiac muscle hypertrophy and dilatation. There is a statistically significant correlation between the ejection fraction and the iron deposition status reported by the heart MRI T2* technique (rs=0.282, *P*<0.043). But no statistically significant difference is observed in the iron overload reported by the heart MRI T2* technique for the group with normal and abnormal echocardiography group.
Conclusion: Due to the relation between the ejection fraction and the iron deposition status reported by the heart MRI T2* technique, the heart iron overload could be evaluated cheaper using ejection fraction level.
Keywords: Major Beta-Thalassemia, Iron Overload, Magnetic Resonance Imaging, Echocardiography

Assessment of propranolol efficacy on pediatric haemangioma

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Background: Hemangiomas are the most common vascular tumor in infancy. Systemic corticosteroids are the first choice of treatment although they have many side effects. Recent studies show Propranolol efficacy on hemangiomas treatment. It has rapid effect and few side effects. These reasons make us to review its effect.
Methods: This interventional study was done on 20 children refer to Bu-Ali hospital. Treatment indications were multiple hemangiomas, organ malfunction and enlarging hemangioma. Treatment on those was started by 1mg/kg/day and increased to 3 mg/kg/day and continued for 6 month. After treatment completion 6 month follow up was done.
Findings: Patients mean age was 23.15 ± 11.24 months. 65% of them were female and 35% was male. Mean size of lesion was 4.85 ± 3.26 Cm. 70% patients had acceptable respond (more than 50% decrease in size) and 30% had partial respond (less than 50%). This effect was similar to corticosteroid effect (about 84%), but with less side effects. In this study there was significant relationship between mean lesion size decrease and propranolol usage, but no significant relationship between size of lesion, age, sex and regression.
Conclusion: This study shows that propranolol has acceptable effect on hemangiomas regression and could be suggested as first choice of hemangimas treatment.
Keywords: Hemangioma, Propranolol, Pediatric Clinic

Aquired hemophilia

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Acquired Hemophilia is a rare but serious bleeding disorder characterized by the development of autoantibodies (inhibitors) against plasma coagulation factors, most commonly FVIII. It classically presents with the sudden onset of bleeding symptoms in a patient with no past or family history of bleeding disorder. It is thought to be exceedingly rare in the pediatric population with an estimated annual incidence to be 0.045 per million. Pediatric acquired hemophilia has been described in association with autoimmune conditions, infection and antibiotics, most commonly penicillin- like antibiotics. Unlike classical hemophilia where hemarthrosis is the characteristic bleeding manifestation, most patients with acquired hemophilia present with bleeding into the skin, subcutaneous tissue and muscles, hematuria, hematemesis or melena and postoperative bleeding. Severe subcutaneous bleedings following venipuncture and intramuscular injections have been described.
Keywords: Acquired Hemophilia, Acquired Autoantibody, Eradication of Inhibitor

Distribution of ABO and Rhesus blood group system in Iranian glucose-6-phosphate dehydrogenase deficient newborns

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Background: Glucose-6- phosphate dehydrogenase (G6PD) deficiency is an inherited disorder which is common in Iran and may cause neonatal jaundice. As combination of G6PD and ABO or Rhesus incompatibility leads to higher risk, we aimed to evaluate the distribution of ABO and Rhesus blood groups in G6PD deficient newborns.
Methods: This cohort study was conducted on 150 icteric newborns who admitted to the NICU of educational hospitals in Azad University in North-East state of Iran, Mashhad. G6PD deficiency was evaluated and case and control groups were considered of 50 icteric newborns with G6PD deficiency and 100 icteric newborns with normal levels of enzyme respectively. Distribution of ABO and Rhesus blood group was considered in G6PD deficient newborns and compared with newborns with normal levels of the enzyme. The prevalence of hemolysis was compared in two groups as well.
Findings: Prevalence of hemolysis was 22% in case group and 19% in controls. There was no significant relationship between G6PD deficiency and hemolysis. There was no significant relationship between distribution of ABO and Rhesus blood groups in G6PD deficient newborns.
Conclusion: There was no significant relationship between distribution of ABO and Rhesus blood groups in G6PD deficient newborns in Iran unlike other similar studies.
Keywords: ABO Blood Group, Rhesus Blood Group, G6PD Deficiency, Neonatal Hyperbilirubinemia

Distribution of HBB gene mutations in Iran: a comprehensive review

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Beta thalassemia caused by HBB gene mutations is one of the most common single gene disorders worldwide. Nearly 80 to 90 million beta thalassemia minors are living and 60-70 thousands affected infants are born annually worldwide. A comprehensive search on English databases was performed fulfilling all English and Persian papers about mutation detection and frequency of beta thalassemia. The search was done using these keywords 'gene mutation' and 'beta globin' and/or 'beta thalassemia' and 'Iran'. All papers in English and Persian reporting mutation frequency of beta thalassemia patients and premarital couples were selected to analyze the frequency of mutations in different regions and various ethnicities living in Iran. Twenty common mutations were selected for more analysis; the frequency of the mutations was searched among neighboring countries. Mutations of 2104 thalassemics were identified. About 90 beta globin mutations including 30 frameshift, 25 splice and intronic, 15 UTR and regulatory, 14 missense and 6 nonsense mutations is reported from Iranian groups. The following mutations IVSI-5 (G>C), IVS II-1 (G>A), IVS I-110(G>A), Cd36/37 (-T), Fsc 8/9, IVS I-1 (G>A), IVSI -25 bp, Fsc8 (-AA), Codon30 G>C (Monroe) and FSC44(-C) are responsible for about 80% of all mutant alleles throughout Iran. These mutations, even, are the common among neighboring of Iran so that responsible for 60 to 90% of mutations in these countries. Genetics of beta thalassemia mutations in Iran is extensively heterogeneous that neighboring countries. Some of common mutations have been arisen historically from Iran and moved to other populations due to population migrations and genetic drift affects them so that frequencies of some of them have been increased in small populations.
Keywords: Beta-thalassemia, HBB Mutations, Iran

Prevalence of anemia in Abhar city children and its relation with breast feeding and iron supplement intake

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Background: Anemia is a global, public health problem affecting both developing and developed countries, especially in childhood. Anemia is the result of wide variety of causes, but the most important cause is iron deficiency; so that iron deficiency anemia and anemia are often used synonymously and the prevalence of anemia has often been used as a proxy of anemia.
Methods: Over period of 1 year, about 200 samples were taken from the children in Abhar Omid Hospital. These data included level of hemoglobin, history of breast feeding, and iron supplement intake. Normal hemoglobin cut of point considered 11 mg/ dl.
Findings: In statistical analysis with SPSS, prevalence of anemia in age group 6-24 month was 45% and in age group 2-12 year was 17%. This study revealed that, there is no significant relationship between anemia and breast feeding or iron supplement intake.
Keywords: Anemia, Breast Milk, Iron Drop

Comparision of therapeutic effect of osveral & desferal in patients with thalassemia (bahonar hospital in karaj 2012-2013)

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Background: This study was performed to compare the therapeutic effect of osveral and desferal in patients with major thalassemia attending to bahonar hospital of karaj 2012-2013.
Methods: In this randomized clinical trial 30 patients with major thalassemia attending to bahonar hospital of karaj in 2012-2013 were enrolled and underwent desferal or osferal group and the ferritin level was measuand compared at baseline and also 1,3,6,9,12 months after drug prescription.
Findings: In this study, the mean ferritin level was alike between two groups except for third month follow up that was significantly higher in osveral group ($p<0.03$).
Conclusion: Totally, according to the obtained results in this study and comparision with other studies it may be concluded that therapeutic effect of osveral and desferal in patients with major thalassemia are similar.
Keywords: Major Thalassemia, Osveral, Desferal, Treatment

Iranian national program for prevention of beta-thalassemia major: comparing genetics counseling result between definite carrier and final suspected couples

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Background: In the Iranian national program for prevention of beta-thalassemia, 1,000,000 couples who plan for marriage are on average screened annually. Results of the screening of all couples are evaluated by genetic counselors and based on national algorithm for the program, couples who are definitely carrier or highly suspicious of binge so, are detected and take part in the specific sessions of genetic counseling.
Methods: The data of specific genetic counseling with 6028987 couples were evaluated to find out the "percentage of couples who withdraw the sessions and who choose not to marry as a estimate of compliance of definite carrier couples and highly suspicious of being carrier couples. The results were examined with Man-Whitney test.
Findings: According to the hematologic indices, 36% couples have been identified at first stage as suspected of being carrier of beta thalassemia (n= 2189245). Among them, 4.19% were found as definite carriers and highly suspicious of being carrier couples (that equal to1.52% of all screened couples). The proportion of definite carrier and highly suspicious couples were respectively 26 and 126 per 10000 screened couples (SE=1.08; CV=0.10 and SE=6.30; CV=0.12). The percentage of not-to-marry couples by definite carrier and highly suspicious couples were respectively 19 and 7 which differed significantly in these two groups (P<0.001). The study also showed that the percentage of withdrawal in definite carrier couples is 1.9 greater than highly suspicious couples (P<0.05).
Conclusion: Higher percentage of withdrawal in definite carrier couples can show that the higher level of certainty of being at risk of the disease increase compliance of the cupules to genetic counseling. This finding can be examined by evaluation of the relevant genetic diagnostic test results of the cupules.
Keywords: Beta Thalassemia, Genetics Counseling, Carrier Couples, Compliance