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GROWTH-RELATED HORMONAL CHANGES AFTER ALLOGENEIC BONE MARROW TRANSPLANTATION (BMT) IN CHILDREN AND ADOLESCENTS.

26 patients grafted for various reasons (SAA N=3; ALL N=16; CML N=4; neurobl N=2; AML N=1) were followed-up. Hypothalamo/pituitary function was tested with LHRH, TRH, GHRH and arginine. Basal serum levels of T, E2, T4, IGF-I, IGF-II, IGF-BP (GH-dependent, 150 kD) were measured (RIA). In cases with poor growth short-term responses of IGFs and IGF-BP to r-hGH (0.07 U/kg BW, 4d s.c.) were investigated. - In 14 cases growth impairment was present (10 prepub). In only 2 of these cases GHD could be proven. In 9 cases IGF-I was also low with normal IGF-II and (in contrast to GHD) IGF-BP, of which 5 showed liver GVH. In 3 cases no abnormalities of hGH and IGFs were seen. IGFs and IGF-BP were less responsive to r-hGH than in GHD. - Conclusions: 1. In general, growth failure and hormonal abnormalities in patients after BMT are primarily related to the extent of prior irradiation and may, thus, be prevented by other X-ray schedules. 2. Mostly, growth failure after BMT corresponds with primarily diminished IGF-I production (from the liver (GVH) or at the sites of growing tissues). Thus, means to elevate IGFs might be tried to treat cases with severe growth failure.

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AUXOLOGICAL FOLLOW-UP OF 32 PATIENTS AFTER BONE MARROW TRANSPLANTATION (BMT) BEFORE 14 YEARS OF LIFE

Long-term effects of BMT during childhood are still to be defined according to the type of BMT (ALLO BMT versus AUTO BMT), the type of preparation regimens (Total Body Irradiation:TBI, Total Lymphoid Irradiation:TLI) and the possible Graft vs Host Disease (GVH). 32 patients (21 B, 11 G) have been followed up for at least one year after transplantation (Leukaemia:21, Lymphoma:3, Tumors:3, Aplastic aneamia:2, Metabolic:3). 11 have been previously given cerebral irradiation (CR). Age at the BMT was 6.7 y (0.4-13.5 y). 20 received ALLO BMT and 12 AUTO BMT. Auxological evaluation was performed at 1 year for all, at 2 in 21 and at 3 in 8. Results are summarized in the table (in SDS according to SEMPE)

	HEIGHT CHANGE SINCE BMT			VELOCITY (CA)		
	1y	2y	3y	1y	2y	3y
CR + TBI* (11)	-0,3	-0.4	-0.6	-1.2	-1.9	-3.1
NO CR + TBI* (13)	-0.2	-0.5	----	-0.5	-1.9	----
NO CR NO TBI (8)	0.5	-0.2	0	1.0	-1.3	----

*TBI given in 6 or more fractions in 21

Height loss was quite similar among patients given TBI, even in the absence of CR. The only regimen leading to normal growth was AUTO BMT without TBI. Our data support a deleterious effect of TBI, even if fractionated, in association with ALLO BMT. The reduction in velocity was not correlated with GH secretion (pharmacological and nocturnal) or thyroid abnormalities. A direct effect of either TBI or GVH on cartilage is likely to explain these results.

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CRANIAL IRRADIATION THERAPY IN ACUTE LYMPHATIC LEUKEMIA HAS NO LONG-TERM EFFECT ON MELATONIN SECRETION

To improve prognosis and outcome of children suffering from ALL, radiotherapy has become an important part of cancer therapy. We studied the long-term effects of cranial irradiation on pineal function regarding diurnal fluctuations of its hormone melatonin (MLT). Patients: 23 pat. following previous treatment for acute lymphatic leukemia were investigated. Chronological age was 12.9 ± 1.4 years (SD). Time since therapy was 5.3 ± 1.9 years (SD) 5 age-matched children without evidence of endocrine disorders served as controls. MLT plasma determinations were done according to (1) with slight modifications improving specificity and sensitivity. Results: Concerning pineal secretory function all children following radiotherapy showed normal circadian MLT secretion with basic levels between 6-15 mg/ml during the daytime and peaklevels up to 65 pg/ml during the night. These values are in total agreement with the diurnal fluctuation of MLT secretion in the controlgroup. Conclusion: Cranial irradiation and chemotherapy does not effect pineal secretory capacity concerning the MLT circadian rhythm which seems to be remarkable stable.

(1) J.C.Commentz et al.: Acta endocrinol Suppl 240,96(1981),108
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THYROID FUNCTION IN THE SURVIVORS OF CHILDHOOD CANCER

This study examines the relative importance of radiotherapy and intensive chemotherapy either alone or in combination in causing thyroid dysfunction. The cancers studied were cerebral tumours, lymphomas, sarcomas and leukaemia. Thyroid dysfunction was identified by a raised serum thyrotrophin stimulating hormone (TSH) level and/or a low serum thyroxine level.

63 children were studied, mean age 7.5y (range 0.2-14.7y), mean follow-up 5.6y (range 0.4-14.8y). Thyroid dysfunction was found in 18/63 (28%. Irradiation to the thyroid ranged from 10-56cGy but abnormal thyroid function was only found when the irradiation dose was >20cGy. The incidence in each of these study groups was:

Thyroid dysfunction	Radiotherapy alone	Radiotherapy & chemotherapy	Chemotherapy alone
	5/11 (46%)	12/29 (45%)	1/23 (4%)

We conclude that irradiation to the thyroid causes thyroid dysfunction in a significant number of survivors of childhood cancer and that this incidence does not appear to be increased by associated chemotherapy.

The known association of thyroid cancer following irradiation and the possible enhancing effect of an elevated serum TSH suggest that replacement therapy with L-thyroxine should be given whenever TSH levels are raised.

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THE EFFECT OF NEUROFIBROMATOSIS ON GROWTH

Although complications of neurofibromatosis (NF) such as scoliosis or optic gliomata are well recognised to impair growth in affected patients, it is uncertain whether the disease in the absence of such findings may affect growth. To elucidate this, the heights of 124 patients with NF were compared with those seen in 34 non affected siblings. The patients with NF originated from 42 different families and ranged in age from 2 to 65 years. The diagnosis was confirmed in all cases by the same observer (SMH) according to currently accepted dermatological criteria. Height measurements were made using a Holtain stadiometer. All patients with complications likely to affect height were excluded from the study. Height data was expressed as standard deviation scores (SDS) according to current United Kingdom growth standards. The mean ± SD height SDS of patients with NF was -1,20 ± 1,07 which is significantly lower than that of -0,12 ± 1,02, which was noted in non affected siblings ($p<0.001$). No significant difference was observed between the height SDS of male and female patients with NF. These findings demonstrate that NF may impair growth in affected individuals by as yet undetermined mechanisms.

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THE IMPORTANCE OF BODY IMAGE TESTING IN SHORT STATURE CHILDREN UNDERGOING CHANGE IN HEIGHT.

It is well known that the basis of positive self-esteem is a healthy body image. Treatment, with now available growth hormone, may also have psychological implications. We studied children with extreme short stature, 6 achondroplastic children and adolescents (ACH-I) (mean height±SEM 119.8±3.7 before and 128±4.5 cm after operation), who were hospitalized for leg-lengthening precedure (modification of Wagner's technique) and 6 (ACH-II) who were operated years before (mean height 138±4.2 cm), as well as a control group with normal height and growth rate (mean 139.3±6 cm). All patients and parents were interviewed. Body image was assessed using Fisher's draw-a-person test and Jourard-Secord's body cathexis test. The figure height in draw-a-person test was 7.7±3.3 cm before and 11.3±2.4 after the operation for ACH-I, 17.8±2.9 for ACH-II, and 23.9±2.2 for the control group. The mean body disturbance score was 4±0.86 in the ACH-I and 2.2±0.58 in the ACH-II. The lowest score was observed in the control group. The total body cathexis score was not different in the three groups. However, negative body cathexis was seen for some body parts in ACH-I. Conclusion: ACH children show a certain improvement of their disturbed body image after the operation. The tests used are simple to perform, with no language limitation and give important information on the success of the treatment.