Final height and body mass index in English and Italian adult survivors of childhood acute lymphoblastic leukemia (ALL) treated without cranial radiotherapy.

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INTRODUCTION

Adult survivors of childhood ALL treated with protocols including cranial radiotherapy (CRT) demonstrated a persistent increased body mass index (BMI) and a reduced final height (FH). To date, long-term data on growth in survivors exposed only to chemotherapy (CT) are only available from small numbers.

AIM OF THE STUDY

- To investigate the effect of CT alone on BMI and FH in an international and wide cohort of childhood ALL survivors.

RESULTS

1a. Demographic data of participants (see Figure 1)

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Age dT (median yrs, range)</th>
<th>Age eT (median yrs, range)</th>
<th>Age FH (median yrs, range)</th>
<th>Follow-up (mean yrs, range)</th>
<th>MTX high dose in / Dex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females (F)</td>
<td>10.0 / 10.6 (5.9 - 17.1)</td>
<td>12.6 / 12.8 (9.3 - 19.7)</td>
<td>13.7 / 14.0 (10.4 - 18.6)</td>
<td>6.4 / 6.8 (3.6 - 9.8)</td>
<td>100 / 100</td>
</tr>
<tr>
<td>Males (M)</td>
<td>10.0 / 10.4 (5.9 - 17.1)</td>
<td>12.8 / 12.8 (9.3 - 19.7)</td>
<td>13.7 / 14.0 (10.4 - 18.6)</td>
<td>6.4 / 6.8 (3.6 - 9.8)</td>
<td>100 / 100</td>
</tr>
</tbody>
</table>

1b. Changes in Height-SDS over time

Albeit in an older cohort (than UK), the Italian data show:
- a reduction of Height-SDS in both sexes
- an increase in BMI-SDS during CT in both genders, but only girls maintain the increase at FH.

2a. Changes in Height-SDS over time

2b. Changes in Height-SDS over time

UK data show:
- an enduring effect on Height-SDS in girls but the effect on BMI-SDS during CT is lost by the time FH is reached.
- In boys, there is no effect on either Height-SDS or BMI-SDS.

3a. Changes in BMI-SDS over time

3b. Changes in BMI-SDS over time

4a. Significant Correlations

4b. Significant Correlations

CONCLUSIONS

1. Italian AIEOP protocols reduce Height-SDS in both sexes. They are associated with an increase in BMI-SDS at the end of CT. Only Italian girls show an increased final BMI-SDS.

2. UKALL XI reduces Height-SDS in girls but not in boys. It has no effect on BMI-SDS in either sex at FH.

3. Previous data on UKALL 97 (no CRT) showed an adverse effect on BMI-SDS of girls but not boys at FH (Harper RLC et al. BJH 2013; 16:3510-513). UKALL 97 differs from UKALL XI in randomizing dexamethasone at induction (with mercaptopurine/thioguanine). As the Italian protocols all contain more dexamethasone than UKALL XI, exposure to high doses of this glucocorticoid might contribute to changes in BMI of female survivors of childhood ALL. However, the effect of high-dose methotrexate cannot be excluded.