Background

• Childhood cancer survivors are at increased risk for obesity, cardiovascular disease, endocrinopathies, secondary cancers and other long term sequelae
• With more survivors, quality of life is an important factor
• Previous studies are mostly in acute lymphoblastic leukemia patients and have contradictory evidence

Purpose:

• Explore potential predictors of obesity in pediatric cancer survivors
• Identify and characterize prevalence

Methods

• Retrospective chart review
• HOPE Survivorship Program is a long term follow up clinic in an urban cancer center in the Rocky Mountain region in the USA
• N= 320 HOPE clinic patients
• Inclusion Criteria
  • Aged 6-21 years
  • Between the years of 2000-2018.
  • Two years post therapy and five years from diagnosis
• Exclusion Criteria
  • Pregnant adolescents
  • Patients with concurrent diagnoses (i.e. diabetes, thyroid disease)

Table 1: Demographic Summary Statistics as Baseline and Four HOPE visits for Those Sampled as Eligible to be Weighted/Obeise at First HOPE Visit. Mean±SD and 2 sample t-test p-value for continuous variables. Odds ratio (OR) with p-value for categorical variables.

<table>
<thead>
<tr>
<th>Predictor</th>
<th>OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>2.18 (1.18, 4.07)</td>
<td>0.012</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2.29 (1.26, 4.16)</td>
<td>0.012</td>
</tr>
<tr>
<td>BMI at diagnosis</td>
<td>1.02 (1.01, 1.04)</td>
<td>0.001</td>
</tr>
<tr>
<td>Total treatment time</td>
<td>1.62 (1.03, 2.61)</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Results

• Odds of being overweight/obese at first HOPE visit are 2.18 times higher for females compared to males (95% CI: 1.18, 4.07)
• Odds of being overweight/obese at first HOPE visit are 2.29 times higher for Hispanics compared to non-hispanic whites (95% CI: 1.23, 4.3)
• A 10% increase in BMI percentile at diagnosis results in 1.03 times greater odds of being overweight/obese at first HOPE visit (95% CI: 1.02, 1.04)
• A 1yr increase in total treatment time results in 1.62 times greater odds of being overweight/obese at first HOPE visit (95% CI: 1.03, 2.61)
• We rejected the null hypothesis that the odds of obesity at first HOPE visit were equal amongst all cancer types (p = .03). The odds of obesity differs between cancer types but due to the small sample size (n for each cancer type), we were unable to determine exactly which cancer types had different odds of obesity.

Conclusions

• Predisposition due to female gender and Hispanic race is similar to that of the general population
• Increased BMI at diagnosis means an increased risk for elevated BMI in survivorship
• Possible explanations regarding treatment length include:
  • Longer duration of treatment potentially means: longer hospitalizations, more complications e.g. sepsis, longer periods of inactivity, longer periods of altered taste buds and food preferences, increased parental leniency

Implications

• Obesity prevention should be focused on those that are at highest risk: Hispanic race, female gender, those overweight at diagnosis and those with prolonged treatments
• Further research is indicated to assess if specific cancer types or treatment types predispose patients to obesity.
Predictors of Obesity in Childhood Cancer Survivors

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BACKGROUND/PURPOSE:

Childhood cancer survivors are at increased risk for obesity, cardiovascular disease, endocrinopathies, secondary cancers and long term sequelae. We explored the predictors of obesity in survivors of childhood cancer. We focused on chemotherapies, cancer types, radiation, and demographics that may influence the development of obesity in childhood cancer survivors.

METHODS

The study was approved by the Colorado Multiple Institution Review Board. It was a retrospective chart review of childhood cancer survivors aged 6 to 21 years (n=430) being followed in a specialized survivorship program. Inclusion criteria were children who were: two years post therapy or five years from diagnosis whichever is later, and followed in the survivors’ clinic. Exclusion criteria were: pregnant adolescents, children with a concurrent diagnosis that could impact weight such as diabetes or other endocrine disorders prior to cancer diagnosis. Data were abstracted from charts and entered in REDCAP. Logistic regression models were used to identify the strongest predictors of obesity.

RESULTS

Obesity at first cancer survivor clinic visit were 2.18 times higher for females compared to males (95% CI: 1.18, 4.07). A 1 percent increase in BMI percentile at diagnosis resulted in 1.03 times greater odds of being overweight/obese at first clinic visit (95% CI: 1.02, 1.04). A 1 unit increase in treatment duration resulted in 1.62 times greater odds of being overweight/obese at first clinic visit (95% CI: 1.03, 2.61). Odds of being overweight/obese at first clinic visit are 2.29 times higher for Hispanics compared to Whites (95% CI: 1.23, 4.3). Cancer type influenced the odds of developing obesity (p=0.03).

CONCLUSIONS

Females, Hispanics, and increased BMI at cancer diagnosis are at highest risk of obesity in survivorship. There was a positive correlation between cancer treatment duration and increased BMI. We identified that cancer diagnoses may have an increased risk of obesity but unfortunately need a greater number of subjects to determine specifically which cancer types increase the risks.