BMI and Cancer Risk in Alaska

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Objective

To determine if patients with cancers that are associated with overweight and obesity have higher than normal BMIs compared to the general Alaska population.
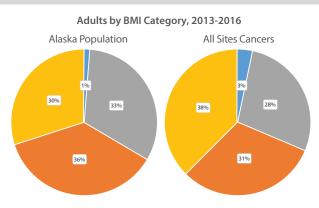
Background

The Alaska Cancer Registry (ACR) was one of 10 registries that participated in CDC's Comparative Effectiveness Research (CER) project for 2011 cases. The project required the collection of patient height and weight, among other new data items. ACR currently has six years of height and weight data, and continues to collect these two data items although the project has ended. No CER registry has used height and weight data outside the CER project.

Methods

Using ACR data, patient Body Mass Index (BMI) was calculated using height and weight, and grouped into categories of underweight, healthy weight, overweight, and obese in accordance with CDC guidelines among adults ages 20 and older.[1] Data quality was evaluated by reviewing the percentage of cases with unknown BMI to maximize the number of diagnosis years with the most robust data. As the first 2 years of data had a proportion of 50% or higher cases with unknown BMI, ACR decided to use the last 4 years of data (2013-2016) for this study.

Result

In Alaska, 69% of adult cancer cases were obese or overweight compared to 66% of the general Alaska population, and therefore look fairly similar (Figure 1). However, this is not the case when individual cancer type are examined. ACR evaluated 7 obesity-related cancers, and found that uterus, kidney, thyroid, and female breast cancers had higher proportions of obesity than the general Alaska population, while stomach and pancreatic cancers had lower proportions (Figure 2). Additional cancer types with varying stages at diagnosis were examined (Figure 3). When evaluated for stage at diagnosis, it was found there is a strong positive correlation between BMI and stage of diagnosis. Cancer types with a greater proportion of cases reported as obese also had a greater proportion of cases reported at early stage. Conversely, cancer types with a lower proportion of cases reported as obese had a greater proportion of cases reported at late stage (Figure 4).

Adults by BMI Category, 2013-2016

Alaska Population / All Sites Cancers

Underweight (<18.5) ■ Healthy weight (18.5 to <25) ■ Overweight (25 to <30) ■ Obese (30+)

FIGURE 1: ADULTS BY BMI CATEGORY, 2013-2016
Data source for the Alaska population: Alaska BRFSS, 2013-2016.
Data source for cancer sites: Alaska Cancer Registry, 2013-2016.

Percent Cancer Cases that are Obese, 2013-2016
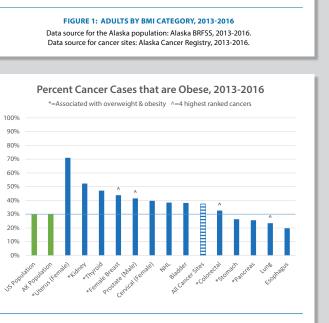*=Associated with overweight & obesity ^=4 highest ranked cancers

FIGURE 2: PERCENT CANCER CASES THAT ARE OBESE, 2013-2016
Blue horizontal line represents percent obesity in the adult Alaska population.
Data source for U.S. population: National BRFSS, 2013-2016.
Data source for Alaska population: Alaska BRFSS, 2013-2016.
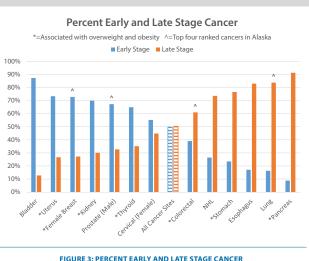Data source for cancer cases: Alaska Cancer Registry, 2013-2016.

Percent Early and Late Stage Cancer
*=Associated with overweight and obesity ^=Top four ranked cancers in Alaska
■ Early Stage ■ Late Stage

FIGURE 3: PERCENT EARLY AND LATE STAGE CANCER
Data source: Alaska Cancer Registry, 2013-2016.
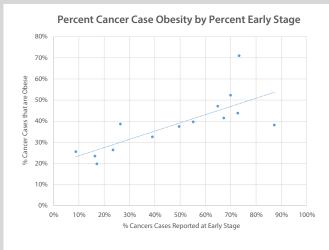

Percent Cancer Case Obesity by Percent Early Stage

FIGURE 4: PERCENT CANCER CASE OBESITY BY PERCENT EARLY STAGE.
Data source: Alaska Cancer Registry, 2013-2016.

Discussion

Although high BMI is a risk factor for certain obesity-related cancers, BMI might not be an obvious indication of cancer risk to health care providers. Of note, cases of stomach and pancreatic cancer (two obesity-related cancers) have lower proportions of obesity at the time of diagnosis; these patients are mostly reported at late stage and are presumably suffering from weight loss by the time they are diagnosed as a result of the progression of their disease (like most registries, ACR does not collect patient history of weight, only weight at the time of diagnosis). Therefore public health education is needed to raise awareness of overweight and obesity as a risk factor for certain cancers, and the importance of having a usual place of care to monitor significant changes in BMI among persons who are overweight and obese.

Summary

Patients with cancers that are associated with overweight and obesity do not necessarily have higher than normal BMIs at the time of diagnosis (e.g., stomach, pancreas), though some cancer types do (e.g. uterus, kidney, thyroid, breast).

Lower BMI is correlated with late stage diagnosis, presumably due to disease progression.

Public health education for healthcare providers is needed to raise awareness of overweight and obesity as a risk factor for cancers associated with higher BMIs as well as to monitor for significant changes in BMI among patients with are overweight and obese.

Acknowledgements:

Reference

[1] Centers for Disease Control and Prevention. About Adult BMI. https://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html, last accessed May 9, 2019.