Closer Look

MEMORANDUM

SEARCH for Diabetes in Youth Study finds increases in childhood type 1 and type 2 diabetes - May 5, 2014

Executive Highlights

- The CDC's SEARCH for Diabetes in Youth Study found that, between 2001 and 2009, the adjusted prevalence of type 1 diabetes rose by 21% in patients age 0-19 years, and the adjusted prevalence of type 2 diabetes rose by 31% in patients age 10-19 years.
- Increases in prevalence were generally seen across age groups, races/ethnicities, and genders.

The results from the SEARCH for Diabetes in Youth epidemiologic study were published in JAMA on Saturday - see the publication, as well as a JDRF statement on the results. The prevalence of type 1 diabetes (out of a sampled population of n=~3.3 million youths age 0-19) rose from 1.48 per 1,000 in 2001 to 1.93 cases per 1,000 in 2009 (p<0.001); when adjusted, this represents a roughly 21% increase in prevalence over eight years. Though this sounds very high, this is about 2-3% each year. The prevalence of type 2 diabetes rose from 0.34 cases per 1,000 (out of n=~1.7 million sampled youths age 10-19) in 2001 to 0.46 cases per 1,000 in 2009; when adjusted, this represents a roughly 31% increase in prevalence. Although the authors did not explicitly expand the results to calculate total patient populations, some quick back-of-the-envelope math (combining 2009 prevalence with 2010 census population data) leads to patient totals of ~160,000 type 1 diabetes patients (age 0-19) and ~20,000 type 2 diabetes patients (age 10-19). Those values may be very slight underestimates, as they apply 2009 prevalence values to 2010 census data, but the type 1 diabetes estimate is still actually lower than the 200,000 - 300,000 we have been used to hearing.

A valuable added dimension to the SEARCH for Diabetes in Youth Study was that results were segmented by race/ethnicity, age group, and gender; importantly, this study represents the first multiethnic data on changes in type 2 diabetes prevalence in youth. The prevalence of type 1 diabetes was highest in white patients (2.55 cases per 1,000 individuals in 2009) and was lower in American Indians (0.35/1,000), Asians/Pacific Islanders (0.60/1,000), black (1.62/1,000) and Hispanic (1.29/1,000) individuals. This trend was nearly reversed for the prevalence of type 2 diabetes: in 2009, type 2 diabetes prevalence was lowest among white youth (0.17 cases per 1,000 individuals), followed by Asian/Pacific Islander (0.34/1,000), Hispanic (0.79/1,000), black (1.06/1,000), and American Indian (1.20/1,000) youth. That said, in terms of trends over time, the increase in type 1 diabetes was seen across nearly every group, except for just a few groups (age 0-4 years and American Indians); notably, while type 1 diabetes is often seen as a disease primarily affecting white youth, the burden appears to be increasingly shared by minority youth as well (a fast-growing population in the US). A modeling study based on SEARCH data forecast that the youth type 1 diabetes patient population could grow to ~587,000 in 2050, due in large part to increases in minority groups (Imperatore et al., Diabetes Care 2012). Interestingly, American Indians and Asian/Pacific Islanders were the only two racial/ethnic groups to not show a significant increase in type 2 diabetes prevalence, but that might be due a high baseline - the increase in white, black, and Hispanic youth was highly statistically significant. The fact that both type 1 and type 2 diabetes prevalence rose so significantly, measurably, and consistently across different subgroups in a relatively short timeframe (eight years) is certainly cause for concern, and these data suggest that prevention efforts for both diseases may need to target a very wide breadth of the population across demographic categories.

We spoke to some diabetes specialists and others, who shared the following:

- **Mr. Jeff Hitchcock (Founder, Children with Diabetes):** "...Silently, with little recognition, the rate of type 1 in youth is exploding. This is incredibly serious. We as a community need to press

for more research into why the prevalence of type 1 is increasing so we can begin to contemplate prevention as real."

- **Dr. Lori Laffel (Joslin Diabetes Center, Boston, MA):** "This is one of the first studies to demonstrate an increase in the prevalence of both type 1 and type 2 diabetes in youth in the United States in the 21st C, from 2001 to 2009. Type 1 diabetes increased by 21% and type 2 increased by 30%, after adjustment for case finding, over that time interval. Reasons for this increase require ongoing investigation and may reflect changes in the proportions of different racial and ethnic groups in the population as well as overall increases in the incidence (numbers of new cases) of diabetes in youth. The SEARCH Study for Diabetes in Youth continues to yield valuable data, such as these. It will be important to assess if the increased occurrence of diabetes in youth continues or stabilizes, as has been suggested by other studies." When asked if she expected similar increases in 2018, Dr. Laffel said: "Data collections methods were similar across time periods studied. While it would be exceptionally alarming to see a similar increase in magnitude over the next eight to nine year interval, I do not think that we can speculate, given other published data have demonstrated a leveling off of the increase. We need to remain vigilant about ascertaining the rates of diabetes while we continue to investigate potential causes and approaches to prevention, intervention, and management."

-- by Manu Venkat and Kelly Close