Autism Prevalence and Precipitation Rates in California, Oregon, and Washington Counties

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Michael Waldman, PhD; Sean Nicholson, PhD; Nodir Adilov, PhD; John Williams, MD, MBA. The primary authors for this study are from Cornell University.

FROM ABSTRACT:

Objective: To investigate empirically the possibility of an environmental trigger for autism among genetically vulnerable children that is positively associated with precipitation.

Design: We used regression analysis to investigate autism prevalence rates and counts first in relation to mean annual county-level precipitation and then to the amount of precipitation a birth cohort was exposed to when younger than 3 years, controlling for time trend, population size, per capita income, and demographic characteristics.

Results: County-level autism prevalence rates and counts among school-aged children were positively associated with a county’s mean annual precipitation. [especially when affecting younger than 3 years of age]

Conclusions: These results are consistent with the existence of an environmental trigger for autism among genetically vulnerable children that is positively associated with precipitation.

THESE AUTHORS ALSO NOTE:

Thirty years ago the estimated rate of autism in children was 1 in 2500.

Recent autism estimates from the Centers for Disease Control and Prevention (CDC) is 1 in 150 children.

The US Department of Education collects autism prevalence data by state; their data shows a trend towards higher autism rates in northern states and lower autism rates in southern states. For example, a recent CDC study showed the highest autism prevalence in New Jersey and the lowest autism prevalence was found in Alabama.

The Cascade Mountains run north to south across Oregon and Washington. Counties west of the Cascades receive almost 4 times more precipitation, on average, than eastern counties. “Autism rates for school-aged children were much higher in the western counties.”
COMMENT FROM AUTHORS:

“Autism prevalence rates for school-aged children in California, Oregon, and Washington in 2005 were positively related to the amount of precipitation these counties received.”

Therefore, these authors believe their data supports their hypothesis that there is an environmental trigger for autism in genetically susceptible children.

There are a number of possibilities concerning what such an environmental trigger might be:

1) “One possibility is early childhood television and video viewing. It seems plausible that early childhood television and video viewing is positively associated with precipitation. Furthermore, television and video viewing by very young children has previously been associated with psychopathological characteristics in the pediatric literature, including problems concerning language development, cognitive development, and the development of later behaviors consistent with attention-deficit hyperactivity disorder.”

2) “Another possibility is that vitamin D deficiency is an environmental trigger for autism. Because precipitation very likely leads to less time outdoors and sunshine is the major source of vitamin D, precipitation is plausibly associated with a higher frequency of vitamin D deficiency. Vitamin D deficiency can lead to reduced levels in the developing brain of calcitriol, a critical neurosteroid involved in brain development. Of interest, while health care providers have exhorted patients during the last 20 years to reduce sunshine exposure, autism prevalence has been increasing. It is also of interest to note that evidence indicates a substantial incidence of vitamin D deficiency in the United States and elsewhere among infants and toddlers.”

3) Chemicals used in household cleaners may serve as a trigger, and precipitation, with the concomitantly increased time that children spend indoors, may indirectly increase exposure to this chemical. “Our results could be explained by one of these chemicals being an environmental trigger for autism because precipitation would increase the prevalence of the chemical on the ground and therefore potentially increase the exposure rate with genetically vulnerable children.”

4) “Another possibility is that increased precipitation might promote weed growth or expansion of the insect population, which triggers an increased use of pesticides, which may serve as an environmental trigger for autism. In fact, there is some evidence that certain pesticides are an environmental trigger for autism.”

KEY POINTS FROM DAN MURPHY

1) 30 years ago the estimated rate of autism in children was 1 in 2500.
2) Recent autism estimates from the Centers for Disease Control and Prevention is 1 in 150 children.

3) The US Department of Education collects autism prevalence data by state; their data shows a trend towards higher autism rates in northern states and lower autism rates in southern states. For example, a recent CDC study showed the highest autism prevalence in New Jersey and the lowest autism prevalence in Alabama.

4) “Autism prevalence rates for school-aged children in California, Oregon, and Washington in 2005 were positively related to the amount of precipitation these counties received.”

5) These authors believe their data supports their hypothesis that there is an environmental trigger for autism in genetically susceptible children.

6) There are a number of possibilities concerning what such an environmental trigger might be:
   A)) “One possibility is early childhood television and video viewing. It seems plausible that early childhood television and video viewing is positively associated with precipitation. Furthermore, television and video viewing by very young children has previously been associated with psychopathological characteristics in the pediatric literature, including problems concerning language development, cognitive development, and the development of later behaviors consistent with attention-deficit hyperactivity disorder.”

   B)) “Another possibility is that vitamin D deficiency is an environmental trigger for autism. Because precipitation very likely leads to less time outdoors and sunshine is the major source of vitamin D, precipitation is plausibly associated with a higher frequency of vitamin D deficiency. Vitamin D deficiency can lead to reduced levels in the developing brain of calcitriol, a critical neurosteroid involved in brain development. Of interest, while health care providers have exhorted patients during the last 20 years to reduce sunshine exposure, autism prevalence has been increasing. It is also of interest to note that evidence indicates a substantial incidence of vitamin D deficiency in the United States and elsewhere among infants and toddlers.”

   C)) Chemicals used in household cleaners may serve as a trigger, and precipitation, with the concomitantly increased time that children spend indoors, may indirectly increase exposure to this chemical.

   D)) “Another possibility is that increased precipitation might promote weed growth or expansion of the insect population, which triggers an increased use of pesticides, which may serve as an environmental trigger for autism. In fact, there is some evidence that certain pesticides are an environmental trigger for autism.”