

# Early detection of childhood eye cancer doesn't always improve survival, prevent eye loss

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For the most common form of childhood eye cancer, unilateral retinoblastoma, shortening the time from the first appearance of symptoms to diagnosis of disease has no bearing on survival or stage of the disease, according to a study by researchers at Columbia University Mailman School of Public Health in partnership with the Hospital Infantil de Mexico. The results appear online in the journal *Cancer Epidemiology, Biomarkers & Prevention*.

Because retinoblastoma is easily detectable by shining a light into a child's eye—often as a "cat's eye" reflection revealed through flash photography—a number of countries, particularly resource-poor countries where the disease is more prevalent, have initiated education and screening programs, thinking that catching the disease early would lead to improved outcomes. This study is the first to follow a cohort of children with the disease over time and to look at the unilateral (one eye) and bilateral (two eyes) forms of the disease separately.

"Our study suggests that screening children for retinoblastoma may not improve outcomes for the majority of patients, particularly for the more common form of the disease affecting one eye," says senior author Manuela A. Orjuela, MD, ScM, assistant professor of pediatrics and environmental health sciences at Columbia University Medical Center. "By the time the tumor is visible in the child's eye, vision is infrequently salvageable, and removal of the eye is usually necessary to prevent

spread of the disease."

The research team followed 179 children with retinoblastoma in Mexico City and interviewed their parents about symptoms and socio-demographic factors. Physicians at the Hospital Infantil de México assessed disease stage using several validated methods. The researchers found that for unilateral disease, the lag-time between when parents first noticed the disease and when the children were diagnosed had no bearing on disease stage or survival. In the rarer bilateral disease, a longer lag-time was strongly associated with a more advanced stage and worse survival, but it did not predict the extent of disease involvement in the more affected eye. Lag-times averaged seven and eight months for unilateral and bilateral disease, respectively.

"Retinoblastoma is usually thought of as one disease. But there is good evidence that unilateral and bilateral retinoblastoma are distinct and progress in different ways," says Dr. Orjuela.

"There is also significant variation in how tumors respond to treatment, no matter how soon we initiate therapy," says first author Marco A. Ramírez-Ortiz, MD, chief of the department of Ophthalmology at the Hospital Infantil de México Federico Gomez, Mexico City.

## **Education and Housing Conditions Predict Outcomes**

Intriguingly, the researchers found that stage and survival in both forms of retinoblastoma were predicted by the mother's education level. Mothers with less formal schooling had children with significantly higher stage disease and significantly worse survival. Education was more important than the time needed for families to travel to the hospital or how many other young children needing childcare were in the household.

The child's home environment may be another contributing factor. Children born in homes with dirt floors had more advanced disease than their peers with different housing conditions, even after taking family income into account, says Dr. Orjuela. "There is a possibility that these children were exposed to metal or some other toxin in the dirt, although confirming this hypothesis would be difficult, given the rarity of the disease."

The finding on maternal education may offer a more fruitful intervention. "We may need to rethink the costs and benefits of screening programs and consider how to improve survival among [children](#) with less-educated parents," says Dr. Orjuela.

"Although pathologic stage and tumor histology are important in the diagnosis and prognosis of retinoblastoma, social factors can help us gain new insights into how the disease progresses and, eventually, new ways to prevent and treat it," says co-author Lourdes Cabrera-Muñoz, MD, Departamento de Patología, Hospital Infantil de México, Mexico City.

This work represents the latest finding from a longstanding multi-institutional collaboration involving co-authors Aurora Medina-Sansón and M. Veronica Ponce-Castañeda at the Hospital Infantil de México Federico Gomez, Mexico City; and Xinhua Liu at the Mailman School.

Provided by Columbia University's Mailman School of Public Health

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