



ADVANCING HEALTH EDUCATION & RESEARCH

AVA Research Reviews provides AVA members with recent published, peer-reviewed articles in a broad array of violence and abuse topics. The goal is to highlight and disseminate violence and abuse research in a timely fashion, and to enhance healthcare providers' practice by fostering the educational mission of AVA

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AVA Research Review

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Review Title: We now can explain WHY people who appear older than stated age often suffered adverse childhood experiences!

Reviewer(s): Nancy Hardt, MD, Professor, Pathology and Obstetrics and Gynecology, University of Florida College of Medicine

Article(s): Exposure to violence during childhood is associated with telomere erosion from 5 to 10 years of age: a longitudinal study

Article Summary:

Brief Overview of issue:

Telomeres are of interest in that they are the signals that reside at the ends of our chromosomes. They keep the ends of chromosomes from getting stuck together during cell division which helps appropriate chromosome numbers to enter new cells at division. These end signals have been observed to get shorter as we age, as though

they somehow get used up during the process of cell division. So the telomere length is a measure of how "old" our chromosomes are or how many times they can replicate before they get stuck together and result in an abnormal cell, which cannot function.

Because other researchers had noted that telomere shortening is pronounced in adults with health risks, social disadvantage, and psychiatric disorders, studies on adults have successfully linked recall of adverse childhood experiences with shortened telomere lengths in adulthood. What was not known was whether the telomere shortening occurred at the time of adult onset of physical ailments and symptoms or occurred at the time of childhood adversity.

Aim of the article:

Shalev et al. were the first research team to apply this

new basic science to children, namely measuring the length of telomeres in childhood, and comparing the telomere lengths of children who were abused to telomere lengths of children who were not. They followed the children and the telomeres over time, in a prospective design.

Relevant Findings:

From a cohort of over 2000 British and Welsh same sex twin children followed longitudinally, a subsample of 118 Caucasian families including 236 children were selected. These children were tested for telomere length at ages 5 and 10, and their exposure to violence at any time in their 10 years of life was ascertained. Violence was defined as domestic violence between caregiver and partner, physical maltreatment by an adult, and bullying victimization. One-hundred and twenty eight of the children had no exposures to violence, 69 had one, and 39 had two or more.

There was little discordance between twins whose caregivers reported 17% exposure to domestic violence, 24% bullying victimization, and 27% physical maltreatment by an adult. The children's telomere lengths were evaluated at ages 5, 7, and 10.

Results indicated that exposure to violence has a cumulative shortening effect on telomeres. Children exposed to two or more forms of violence had the greatest velocity in telomere shortening. Children exposed to one form of violence had an increase in telomere shortening as compared to children with no reported exposure, but less shortening than the children exposed to two or more forms of violence.

In other words, cumulative exposure to violence is related to early aging of cells, and therefore early aging of the entire body. So early childhood stress begins the process of "appearing older than stated age."

Of interest, 17% of children experienced telomere lengthening, which is a fruitful avenue for future study. Is this a laboratory error or is this physical evidence of resilience? The authors discussed various laboratory issues that may produce this result, but did not mention the possibility of resilience developing, since some of the children had been removed from their violent homes.

Potential Limitations:

There are some shortcomings to this study. First, the definition of domestic violence used is one we would likely term incomplete, at best.

Domestic violence was ascertained in the 10% most violent families as determined by 10 acts of physical violence listed on the Conflict Tactics Scale. We all know that domestic partner power and control and emotional abuse can be extremely detrimental to children, and victims usually judge these forms of abuse to have longer lasting effects than physical violence alone.

Likewise, the children were not ascertained for victimization by sexual abuse or emotional abuse, physical neglect, or emotional neglect. Only physical abuse of children was ascertained. Many child behaviorists believe that repeatedly experiencing "fear" causes stress to children, whether fear is accompanied by physical abuse or not. These study design shortcomings result in under ascertainment of childhood exposure to violence and the effects on the telomeres of children.

Reviewers' Comments:

As an academic autopsy pathologist, I teach residents. When we do our complete physical examination on the decedent, one of the first statements in our report is whether he or she appears stated age. I would say fewer than half of our patients appear their stated age. A tiny proportion appear younger

than stated age, and about half appear older than stated age.

On review of the chart, patients who appear older than stated age often have either huge families (many children) or no one. Many have histories of addiction, anxiety and depression, chronic pain, and other somatiform disorders. Most have the metabolic syndrome with obesity, sleep apnea, hypertension, type 2 diabetes, gastroesophageal reflux. And, yes, they are more likely to have tattoos!

I had always noticed in practicing obstetrics that women who appeared older than stated age had many children, had them close together, and or had them at advanced maternal ages. I naively thought that women who gave birth in close succession were just careworn due to the duties of raising many small children. I now realize that these women probably appear older than stated age because their telomeres are shorter. Their telomeres may be shorter because of the stress associated with partner maltreatment that comes with unintended pregnancies in the form of birth control sabotage and reproductive coercion.

Reviewer's Summary:

In summary, Shalev et al. report basic science evidence

supporting the linkage between cumulative effects of childhood exposure to violence and cellular structure and function. Taken one step further, this research explains why our early childhood social and health policies should protect children from exposure to violence and bullying. Doing so would have health benefits for children throughout their lifetimes.