

Cytomegalovirus (CMV) infection is one of the important contributing factors to the **decline of the immune system with age**. Most people are exposed to this mild persistent **herpesvirus** over the course of their life; it causes few obvious symptoms, but over time more and more of your **immune system** resources become uselessly specialized to fight it. An immune cell dedicated to remembering the signature of CMV is unavailable for other uses - and eventually you run out of cells to protect you from new threats, destroy cancers, and **clear out senescent cells**. This process is one part of the frailty and increased risk of death and disease that comes with old age.

A recent study quantified the risk that comes with a CMV-focused immune system. **Mortality rate** and incidence of frailty were compared against levels of anti-CMV immune activity, as judged by concentration levels of **antibodies**:

Cytomegalovirus Infection and the Risk of Mortality and Frailty in Older Women: A Prospective Observational Cohort Study

Present understanding is limited regarding the long-term clinical effect of persistent CMV infection in immunocompetent adults. The authors conducted a prospective observational cohort study (1992-2002) of 635 community-dwelling women in Baltimore, Maryland, aged 70-79 years in the Women's Health and Aging Studies to examine the effect of CMV infection on the risk of frailty, a common geriatric syndrome, and mortality in older women.

The effect of baseline serum CMV antibody (**immunoglobulin G**) concentration on the risk of 3-year incident frailty, defined by using a 5-component measure, and 5-year mortality was examined with **Cox proportional hazards models**. Compared with those who were CMV seronegative, women in the highest quartile of CMV antibody concentration had a greater incidence of frailty (hazard ratio = 3.46) and mortality (hazard ratio = 3.81). After adjustment for potential confounders, CMV antibody concentration in the highest quartile independently increased the risk of 5-year mortality (hazard ratio = 2.79).

A CMV fixation should be thought of as yet another form of malfunction or misconfiguration of the immune system, to be put in the same broad category as **autoimmune diseases**. Some of the research efforts directed towards repairing autoimmune disease may in the future also be turned towards repairing a CMV-specialized immune system. For example, researchers have **successfully rebooted the immune system in human patients** in recent years: completely destroying and then recreating it in order to remove all immune cells with errant programming. Another possibility is the use of **targeted cell killing technologies** that can pick out and destroy CMV-specialized immune cells based on their surface markers.

But I know of no groups seriously working towards this end - a frequent refrain here, sad to say. Far greater progress towards extended healthy life could be underway than is presently the case.

Wang GC, Kao WH, Murakami P, Xue QL, Chiou RB, Detrick B, McDyer JF, Semba RD, Casolaro V, Walston JD, & Fried LP (2010). Cytomegalovirus Infection and the Risk of Mortality and Frailty in Older Women: A Prospective Observational Cohort Study. *American journal of epidemiology* PMID: **20400465**