Preventable Conditions Kill 10.6 Million Children

Most of these causes can be addressed right now with inexpensive and easy interventions that work.

BY MICHELE G. SULLIVAN
Mid-Atlantic Bureau

Six preventable conditions—pneumonia, diarrhea, malaria, neonatal infections, preterm delivery, and asphyxia at birth—account for nearly 75% of the 10.6 million annual deaths of younger children, the World Health Organization has concluded.

The vast majority of these deaths occurred in developing countries and could be prevented easily and inexpensively, said Robert Black, M.D., chair of WHO's Child Health Epidemiology Reference Group (Lancet 2005;365:1147-52).

"Virtually all of these causes can be addressed right now with interventions that work and are inexpensive and easy to deliver," he told FAMILY PRACTICE NEWS. "This information should be enough to wake us up and say 'We haven't been doing enough on this issue.' We hope this report can be used to guide policy and direct programs aimed at saving these children. If countries realize 50% of child death is from infectious diseases, that's where the program efforts and funds should go."

WHO established the reference group in 2001 to estimate causes of death in young children worldwide. The 2004 report used vital registration data and published and unpublished epidemiologic data to create epidemiologic models in six global regions: Africa, the Americas, the Eastern Mediterranean, Europe, Southeast Asia, and the Western Pacific.

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Four communicable diseases are responsible for more than half of deaths in children younger than 5 years: pneumonia (19%), diarrhea (18%), malaria (8%) and neonatal pneumonia or sepsis (10%), with malnourishment an underlying cause of 53% of these deaths. Preterm births accounted for 10% of mortality in the group, and asphyxia at birth another 8%: thus, 28% of deaths in children under 5 years occurred in the neonatal period. The report found that most of the deaths of children under 5 years occurred in Africa and Southeast Asia. Africa was especially hard-hit, with 94% of global child deaths from malaria, 46% of deaths from pneumonia, 40% of deaths from diarrhea, and 21% of deaths from neonatal pneumonia or sepsis.

This is the first time WHO has broken out neonatal death data from the general population, said Dr. Black of the Bloomberg School of Public Health, Johns Hopkins University, Baltimore. "Previously, this information was lumped into deaths in the perinatal period, which really makes no sense. We tried to get better estimates and present them in a more meaningful way."

Measles, neonatal tetanus, and HIV/AIDS accounted for only a small proportion of deaths across the globe. The low number of measles deaths (less than 5% of deaths in young children) "is a success story," the study said, but high immunization rates must be sustained for that success to continue.

HIV/AIDS accounted for only about 3% of global deaths in young children, but the infection remains a significant problem. "All countries need to take action against this growing threat," the study said.

Neonatal tetanus deaths were halved in the 1990s. Although the report noted that "this is good news," WHO will not meet its goal of eliminating this as a cause of death by 2005.

It's no surprise that the highest proportion of deaths occurred in the poorest countries, Peter Byass and Tedros A. Ghebreyesus said in an accompanying editorial. Poverty is the single most important risk factor for childhood death (Lancet 2005;365:1114-6).

"In terms of preventing children dying, the old adage that 'you get what you pay for' seems to apply. In today's world, an Ethiopian child is over 30 times more likely than a Western European to die before his or her fifth birthday," said Mr. Byass of Umeå University (Sweden) and Mr. Ghebreyesus of the Federal Ministry of Health, Addis Ababa, Ethiopia.

Meanwhile, they noted, every day, the average citizen in any of the four countries that spend the most on health consumes the equivalent health resources available to a typical Ethiopian in an entire year. ■

Research Chews Over New Test for Determining Risk for Dental Caries

BY MICHAEL FELTON
Contributing Writer

WASHINGTON — A test may soon be able to determine which patients, whether children or adults, are at greatest risk for dental caries, Paul C. Denny, Ph.D., said at the annual meeting of the American Association for the Advancement of Science.

Caries are the result of infectious disease, and if they remain untreated—in children or adults—they can cause abscesses outside the tooth, affect developing teeth in children, and even affect facial structures such as the jaw, said Dr. Denny of the University of Southern California.

The infectious agents are acid-producing bacteria that live in the mouth. These bacteria "have receptors on their cell walls that attach to specific sugars on chains of glycoproteins that are found in your saliva," he said.

These glycoproteins form a coating on the teeth called the pellicle. The bacteria use proteins called lectins to bind to these glycoproteins and then produce acid on the surface of the teeth.

The glycoproteins of the pellicle play a very important role by lubricating the tooth surface. The composition of these sugar chains is genetically determined and varies from individual to individual, said Dr. Denny.

What if some people make sugar chains that facilitate bacterial attachment, and other people do not? The test Dr. Denny and his colleagues have developed uses a small amount of saliva and lectins attached to color-producing enzymes to produce a visible reaction between a specific lectin and its partner glycoprotein. He has formed a company to commercialize the test.

"We do find that some of these sugar types are strongly positively correlated with the number of caries in their mouth, but we also find that some of these chains are negatively correlated with the number of cavities, and it's the relative proportions of these positive and negatively correlated chains that give rise to the great range of [cavities] that one sees within a group of people."

Many of same sugars incorporated into the pellicle also are used to determine blood type. For instance, people with type B blood have galactose as part of the glycoproteins in both their pellicle and saliva.

The researchers tested for eight glycoproteins in 21 different people. After analyzing the data, they created a plot showing that caries risk can be predicted with glycoprotein testing alone.

For instance, the group of people who never had cavities had common glycoproteins (risk level 1), but those who had numerous cavities throughout their mouths had a significantly different combination of glycoproteins (risk level 4).

Between the two extremes, combinations of glycoproteins accounted for those with cavities in their molars (risk level 2), and those with more cavities in both their molars and premolars (risk level 3). Thus, with testing of a person's glycoproteins, his or her level of risk for dental caries can be assessed.

"And if you apply this to children before they have caries, you have the prescription or treatment plan for prevention," says Dr. Denny. "You could have children grow up caries-free regardless of their risk level."

Dr. Denny showed the results from children's saliva, which suggested that even though they do not have any caries yet, by their late 20s, they can expect to have 3-8 cavities unless there is intervention such as fluoride treatments, better oral hygiene, and more frequent dental checkups. ■

HAART in Children Lowers Rates of HIV Encephalopathy

The rate of active progressive HIV encephalopathy in children with HIV infection receiving highly active antiretroviral therapy was less than 2% and the cumulative prevalence of arrested disease was 10%, results from a prospective study demonstrated.

"In the era of HAART, HIV has been transformed from an invariably fatal disease to a chronic disease in which survival is expected," Claudia Chiriboga, M.D., of the division of pediatric neurology at Columbia University Medical Center, New York, and her associates said. "PHE in the post-HAART era is thus an infrequent and reversible complication of HIV infection that responds to effective antiretroviral control and that may relapse if viral control is lost."

Few studies have sought to determine the incidence of progressive HIV encephalopathy (PHE) since HAART was introduced in the late 1990s. Dr. Chiriboga and her associates prospectively evaluated 126 children with HIV who have been assessed yearly by a neurologist at Harlem Hospital Center since 1988 (J. Pediatr. 2005;146:402-7).

The children received baseline evaluations from a pediatrician and neurologist in 2000. The investigators reviewed medical records for HIV disease manifestations, antiretroviral treatment, and immunologic and virologic measures. They also assessed the children for PHE, developmental delay, and attention-deficit hyperactivity disorder.

All children had been perinatally infected with HIV. Half were male, and only 11 were older than 3 years. Their mean age at baseline evaluation was 23 months, and they were followed for an average of 82 months.

The investigators observed that in 2000, the rate of active PHE was 1.6% (2 children),and the prevalence of arrested PHE was 10% (13 children). They also found that the majority of survivors experienced residual motor and cognitive sequelae and needed special education.

Other observations were that PHE relapse occurred in three children with previously arrested PHE, viral load was the only significant risk factor associated with PHE, and neither HIV nor PHE was associated with the development of ADHD.

The findings suggest that, "as refers to PHE progression, viral load should be monitored [as well as CD4 count] in order to achieve a more comprehensive appraisal of progression of HIV disease," the investigators said.

—Doug Brunk