# Research finds first oral bacteria linking a mother and her stillborn baby

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Yiping Han, a researcher from Department of Periodontics at Case Western Reserve University School of Dental Medicine, reports the first documented link between a mother with pregnancy-associated gum disease to the death of her fetus.

The findings are discussed in the article, "Term Stillbirth Caused by Oral *Fusobacterium nucleatum*," in the February issue of *Obstetrics & Gynecology*.

An internet search in 2008 led a friend of a mother, who had just delivered a stillborn baby, to Han's research lab—one of the few in the world working on understanding the role variations of the oral bacteria, *Fusobacterium nucleatum*, have on pre-term labor and stillbirths.

The mother delivered her fullterm baby at Saint John's Health Center in Santa Monica, Calif., at 39 weeks and five days.

During the 35-year-old mother's pregnancy (her first), she told Han she experienced excessive gum bleeding, a symptom of pregnancy-associated gingivitis. Approximately 75 percent of pregnant women experience gum bleeding due to the hormonal changes during pregnancy.

"There is an old wives' tale that you lose a tooth for each baby, and this is due to the underlying changes during pregnancy," said Han, "but if there is another underlying condition in the background, then you may lose more than a tooth but a baby."

Bleeding associated with the gingivitis allowed the bacteria, normally contained to the mouth because of the body's defense system, to enter the blood and work its way to the placenta.

Even though the amniotic fluid was not available for testing, Han suspects from work with animal models that the bacteria entered the immune-free amniotic fluid and eventually ingested by the baby.

Han says normally a mother's immune system takes care of the bacteria in the blood before it reaches the placenta. But in this case, the mother also experienced an upper respiratory infection like a cold and low-grade fever just a few days before the stillbirth.

"The timing is important here because it fits the time frame of hematogenous (through the blood) spreading we observed in animals," Han said.

Postmortem microbial studies of the baby found the presence of *F. nucleatum* in the lungs and stomach. The baby had died from a septic infection and inflammation caused by bacteria.

After questioning the mother about her health during the pregnancy, Han arranged for her to visit a periodontist, who collected plaque samples from her teeth.

Using DNA cloning technologies, Han found a match in the bacterium in the mother's mouth with the bacterium in the baby's infected lungs and stomach.

Han also ruled out by testing bacteria from the vaginal and rectal areas, which did not show the presence of *F. nucleatum*.

"The testing strongly suggested the bacteria were delivered through the

blood," Han said.

With preventative periodontal treatment and oral health care, the mother has since given birth to a healthy baby.

Han, who has spent the past decade taking her oral bacteria research from the lab to the bedside, says this points again to the growing importance of good oral health care.

In addition to this direct link from the mother to her baby, oral bacteria have been associated with heart disease, diabetes and arthritis.

The researcher suggests women, who are considering a pregnancy, seek dental care to take care of any oral health problems before getting pregnant. If pregnant, she encourages expectant moms to practice good oral health and alert the doctor to any gum bleeding.

Provided by Case Western Reserve University