Aspirin may block pregnancy hypertension

Aspirin, that old standby of the home medicine cabinet, recently proved its worth in reducing the risk of heart attack and some types of stroke. Now, statisticians suggest that very low daily doses of aspirin help protect pregnant women from a risky type of high blood pressure.

Pregnancy-induced hypertension (PIH) strikes up to 15 percent of all pregnant women in the United States. Some develop preeclampsia, in which blood pressure rises, usually during late pregnancy, with symptoms such as headaches, blurred vision and swollen ankles. Preeclampsia can progress to eclampsia, which causes seizures, coma and sometimes the death of the mother and fetus.

Some researchers have speculated that PIH results from overproduction of thromboxane A_2, a fatty-acid derivative that constricts blood vessels – including those in the placenta, which deliver nourishing blood to the fetus. To test the theory, several teams have focused on aspirin treatment, since aspirin inhibits the body's synthesis of thromboxane A_2. However, the preliminary trials conducted so far have provided no clear-cut picture of the drug's potential for preventing PIH.

Now, two researchers have taken another look at those data, this time using a powerful statistical method, called meta-analysis, that combines data from several different studies and thus improves the researchers' ability to detect treatment effects.

At Case Western Reserve School of Medicine in Cleveland, Thomas F. Imperiale and Alice Stollenwerk Petrulis analyzed data from six small clinical trials with low statistical power. The studies, conducted in the 1980s, had yielded results ranging from no aspirin benefit to marked reductions in PIH risk. All 394 pregnant participants had a past history of PIH or other risk factors for the condition. About half received small daily doses of aspirin (60 to 150 milligrams), usually beginning in the second trimester. Each trial included a control group, but some control groups received daily placebo tablets, while others received no placebo.

For a clearer estimate of aspirin's effects, the Cleveland researchers pooled the data from all six studies. In comparing treated women with controls, they discovered that the low aspirin doses reduced the chances of developing PIH by 65 percent – a highly significant risk reduction, according to the team's report in the July 10 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

Aspirin also reduced the chances of bearing a severely low-birthweight baby – a threat that often accompanies PIH. Such tiny babies commonly suffer multiple health problems.

Imperiale and Petrulis found no adverse effects associated with aspirin treatment. However, they note that the treated volunteers took only 1 to 1½ child-size aspirin tablets daily. In some individuals, the higher dose in an adult-size tablet could trigger hemorrhaging and other problems, Imperiale warns. The researchers advise pregnant women to consult their obstetricians before considering daily aspirin therapy, even at low doses.

While the new report supports the theory linking aspirin, PIH and thromboxane A_2, obstetrician John T. Repke points out that researchers have yet to establish aspirin's safety and efficacy against PIH in a large clinical study of pregnant women.

Repke, of the Johns Hopkins University School of Medicine in Baltimore, says his own preliminary trials hinted that calcium supplements may help prevent PIH.

That theory gains backing from a Canadian study reported in the June 15 AMERICAN JOURNAL OF EPIDEMIOLOGY. The new work – an epidemiologic study led by Sylvie Marcoux of Laval University in Ste. Foy, Quebec – suggests that a calcium-rich diet, especially during the first and second trimesters, may reduce the risk of developing a hypertensive disorder during pregnancy. *– K.A. Fackelmann*

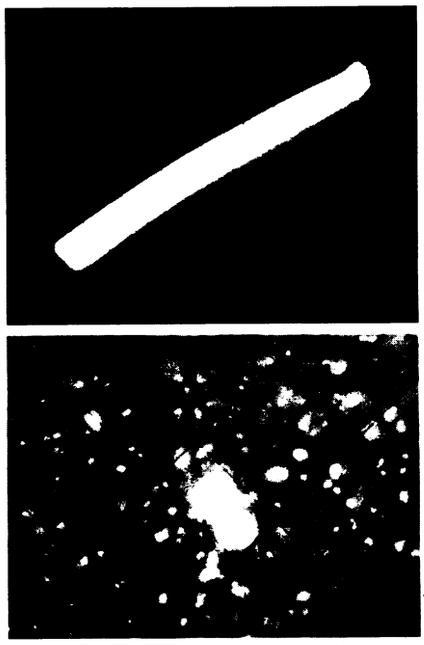
Shuttle surprise: Zeolites form odd rods

When chemical engineer Robin Stewart peeked into a test chamber she had sent into space last April, the last thing she expected was some rod-shaped crystals. She and her co-workers had set up an experiment to grow an inorganic compound called a zeolite during the six-day flight of the shuttle Atlantis. Usually, zeolites form cubic or octahedral crystals, so the rods came as quite as surprise, she says.

Zeolites occur naturally as minerals in metamorphic rock. These aluminum-silicate compounds are full of holes and can sop up and ooze water. Within the cubic formation, zeolite atoms arrange themselves into tetrahedral rings that link up to form tiny channels. Thus, chemists can use them as molecular sieves, catalysts and even water softeners. Zeolites play a key role in refining gasoline, and chemical companies use them to separate molecules of varying sizes and shapes and to absorb gases and vapor mixtures. Scientists continue to explore new ways to make these multipurpose crystals, Stewart says.

Outer space offers one new approach. As a material crystallizes on Earth, gravity can cause some crystals to settle out, leaving flaws in the material. So chemists seeking perfect samples for analysis find the space shuttle an attractive environment for their experiments. Until April, chemists tended to use the shuttle primarily for crystallizing proteins. In most cases, the materials assume the same shape in space as they do on the ground, Stewart says. However, one team did get unusual lead iodide crystals from space experiments conducted two years ago (SN: 9/23/89, p.206).

Stewart and several colleagues at the National Institute of Standards and Technology's Biophysical Measurements Group in Boulder, Colo., undertook their zeolite project in collaboration with Instrumentation Technology Associates, Inc., of Exton, Pa. The researchers set up a reaction vessel that allows the chemicals



Stewart/NIST

These photos, released in June, show a zeolite rod grown in space (top) and typical cubes grown on Earth.

that form zeolites to ooze into a gel, where they combine to form crystals. Stewart sent up several experiments on the shuttle and ran identical tests in her lab as controls. In space, she says, "the only thing we took away was gravity."

The microscopic rods returned by Atlantis proved that zeolites can grow in the span of a short shuttle flight, Stewart says. However, since the crystals were too small for more detailed study, she does not know why they took on an elongated shape.

"It actually raises more questions than it answers," she says. "But the first time through, you never do know what you will get."

Stewart, now with ADA Technologies in Englewood, Colo., says she hopes to try again and get larger zeolite crystals from space. *– E. Pennisi*