Researchers eye alternative to amniocentesis: study

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CHICAGO, March 2 (AFP) - US researchers said Tuesday they have made a quantitative leap forward in developing a procedure that could one day enable doctors to diagnose foetal abnormalities such as Down syndrome by means of a simple blood test.

The current prenatal tests for birth defects -- amniocentesis and CVS -- are highly reliable, but are invasive and carry a risk of miscarriage, causing many women to shun them.

Scientists have known for some time that "free foetal DNA," recovered from a blood sample taken from a mother could be used to screen for genetic abnormalities, but the test has never been viable because of the small amounts of DNA recovered.

Now researchers with a Maryland biotech company have developed a process that makes it easier to extract more of the foetal DNA from a mother's blood plasma, according to a study in the Journal of the American Medical Association.

By treating the blood samples with a chemical agent called formaldehyde that preserves the structure of DNA and by minimising the gravitational forces used during the centrifugal -- or separation -- process, Ravgen Inc. researchers were able to harvest more than four times as much DNA than in previous such experiments.

In a preliminary study involving blood samples taken from 69 pregnant women, half of the blood samples treated this way yielded an average of 25 percent free foetal DNA, while a quarter of the samples contained 50 percent or greater foetal DNA.

"This lays a solid foundation for the development of a noninvasive prenatal diagnostic test," said Ravinder Dhallan, the chief executive officer of Ravgen Inc, in Columbia, Maryland.

In an editorial, two gynecologists from the Baylor College of Medicine in Houston, Texas, said the findings "have major clinical implications."

In addition to its role in diagnosing prenatal abnormalities that could point to conditions such as spina bifida or Down syndrome, Joe Simpson and Frideh Bischoff suggested that cell-free DNA might be useful for monitoring complications of pregnancy such as preeclampsia (high blood pressure).

"A sharp increase in fetal DNA levels in maternal plasma during the last eight weeks of pregnancy has been demonstrated, presumably indicating breakdown of the maternal fetal interface and placental barrier.

"Any pathological process that disturbs the placenta should be accompanied by increased levels of cell-free fetal DNA in maternal blood," they wrote.