



Science Magazine Podcast Transcript, 12 July 2013

http://podcasts.aaas.org/science_news/SciencePodcast_130712_ScienceNOW.mp3

Promo

The following is an excerpt from the *Science* Podcast. To hear the whole show, visit www.sciencemag.org and click on “*Science* Podcast.”

Music

Interviewer – Sarah Crespi

Finally today, we have David Grimm, online news editor for *Science*. He’s here to give us a rundown of some of the recent stories from our daily news site. I’m Sarah Crespi. So Dave, first up, we have a story on the timing of pregnancies. We’ve known for a long time that summer babies are healthier than winter babies but not the why.

Interviewee – David Grimm

Right. And these are babies that are born in the summer versus those that are born in the winter. There’s been this correlation that’s been around for a long time. Scientists have seen that children that are born in the winter tend to have more health problems later in life. They tend to be slower growers, have higher incidences of mental illness, and even early death. But it’s really been unclear, is that really happening? You know, is that just sort of kind of an old wives’ tale that’s maybe got amplified over time. And if it is happening, why is it happening? And that’s what this new study is all about.

Interviewer – Sarah Crespi

So why has it been so difficult to tease out the cause of this or whether or not it’s really true?

Interviewee – David Grimm

Well, some studies have shown this correlation between time of birth and problems later in life. The problem is that time of birth, season of birth, month of birth, that’s not the only thing going on. There are socioeconomic factors that also play into it. Obviously, mothers that are poorer or have access to fewer resources may also give birth to babies that are less healthy, and researchers have had a hard time separating that from the time of year that the children are born. So what this new study does is it actually controls for socioeconomic status by only looking at siblings. So the mother is not changing. It’s just that the kids are just born at different times of year.

Interviewer – Sarah Crespi

So were they able to see this difference?

Interviewee – David Grimm

Yes, they actually saw the effect. They saw that babies that were conceived in May especially (and that’s babies that are going to be delivered in the winter) were 13% more likely to be born premature. Their gestation time was almost a week below the average.

Both of these factors can correlate with things like weaker immune systems, poorer vision and hearing, and slower cognitive development, which could all display later in life. And therefore, you have this link between month of birth and potential health problems.

Interviewer – Sarah Crespi

So they've been able to clinch that and say, here's the correlation, but do they know why? Do they know why when you're born might affect your health?

Interviewee – David Grimm

Well, they don't know why, but they have some speculation. What they saw was another correlation this time between the time of year that women were delivering and flu season. In fact, when the H1N1 pandemic struck a couple years ago, it struck about two months earlier than usual than the typical flu season does, and that year, the researchers saw the correlation between birth month and ill health effects also change by two months in that direction. And all this suggests to them that perhaps something about the flu, the flu season, is causing mothers to deliver early. And obviously the earlier that these mothers are delivering, the more health problems the child could have.

Interviewer – Sarah Crespi

So are they going to recommend that people have babies at different times of year?

Interviewee – David Grimm

That's a good question. I mean, the thing to keep in mind is the worst month that they saw for having babies was May, and even then, the mothers were only 13% more likely to have babies that were born premature. And prematurity isn't always 100% linked to all these other problems. So you're talking about potentially very small percentages – probably not enough to encourage people to only try to conceive at certain times of the year – but interesting speculation about why this effect might be happening.

Interviewer – Sarah Crespi

Next up, we have another pregnancy story – this one with an autism focus. Autism has become an incredibly common disorder, but researchers are still striving to find a cause. A pair of studies seem to show that maternal antibodies may play a role.

Interviewee – David Grimm

That's right, Sarah. And for a long time when researchers have been looking at autism, they've been looking at genetic factors. There's something about mom or dad's DNA that's predisposing their children to autism. These new studies, both performed by the same group, take a different tact. Basically, what they look at is antibodies circulating in the mother's blood. And we already know that antibodies, although they do a lot of good for us, can also do harm. If they turn against our bodies, they can cause autoimmune diseases, things like arthritis and other diseases. And so the question this group had was, might these autoantibodies, as they call them, also play a role in autism?

Interviewer – Sarah Crespi

So what were the clues that this might actually hold?

Interviewee – David Grimm

Well, they found some compelling evidence way back in 2008 when they saw that a quarter of 61 women they looked at that all had autistic children carried an unusual group of antibodies in their blood. And when they did some more studies on these antibodies when they injected them into pregnant mice, they found that the offspring of these mice had some behavioral problems. You know, it's sort of hard to compare autism in mice and humans, but it's just that these antibodies were potentially playing a role in the disorder.

Interviewer – Sarah Crespi

So there are two new studies here, one of which focus on the targets of its antibodies. What did they find there?

Interviewee – David Grimm

Well, that study found that these antibodies seemed to be having some pretty significant effects on neurons in the brain. They seemed to be attacking neurons that were important for memory and learning, for pathways that determine where neurons go in the brain. And that obviously suggests if you have problems with that, you're going to have behavioral problems. The second study, the researchers actually looked at an animal that was much closer to us than mice. They looked at rhesus monkeys, and what they did was they injected some of these antibodies from mothers with autistic children into pregnant rhesus monkeys. And they found that the offspring of these monkeys exhibited some pretty unusual behaviors. First of all, the mothers were overly protective of their infants suggesting they knew something was wrong with the infants that maybe the scientists weren't picking up on. But there were things the scientists did pick up on. One thing that the monkeys did that was really unusual is they approached unknown animals far more often than their peers did, and this is really a potentially dangerous activity for doing that in the wild. It suggests that there's something going wrong behaviorally. Also, the brains of the male monkeys whose mothers had received these injections of antibodies grew larger than those of the females or the controls, and that's actually a pattern that's seen in human babies with autism as well.

Interviewer – Sarah Crespi

So what are the applications for this new information? What can we do with this?

Interviewee – David Grimm

Well, the researchers suggest that we can actually develop a diagnostic test based on this. The idea would be that mothers could be tested to see if they've got these antibodies in their blood, and if they do, they may be very likely to have kids with autism. In fact, the researchers suggest that the test could be as much as 99% accurate, at least for a specific type of autism that affects about a quarter of kids with the condition.

Interviewer – Sarah Crespi

So this is a small sample. Is it going to be that broadly applicable?

Interviewee – David Grimm

Well, yes. It's a small sample of monkeys. It's only eight monkeys, and so some of the experts say, you know, you can't really jump the gun and talk about diagnostic tests with such a small sample. It also hasn't been conclusively shown in humans that this test actually would work. So experts are urging caution about how quickly we could go from these findings to actually developing a test for autism that may be on the market or at least in your physician's office.

Interviewer – Sarah Crespi

Finally, we have a story on the relationship between malaria and the immune system. Pathogens and parasites need to balance using us with killing us. If they take too much or do too much damage, there goes their home.

Interviewee – David Grimm

Right. And if they don't do enough damage, they can die. So they've got to really walk this fine line. What that suggests is that parasites that have to fight us are going to get stronger. Now why are they going to fight us? They're going to fight us because we're taking antibiotics, that maybe we've gotten a vaccine, which has sort of ramped up our immune system. And that's indeed what researchers have found that the more that we try to protect ourselves against these parasites, the more they evolve resistance, the stronger they become, which makes sense from an evolutionary perspective. But this new study suggests that, that doesn't always hold true, especially in the case of malaria.

Interviewer – Sarah Crespi

I thought this was a really odd question to ask. They said, what if we put down our arms? Is malaria going to still try to hurt us?

Interviewee – David Grimm

Right. And that's what you would expect. You would say, well, look. We're putting up all these defenses, and all these parasites are getting stronger. What if we just throw down our arms? Will the parasites get weaker? And it turns out, no. The parasites actually get stronger. So throwing down your arms is not a good idea. What the researchers did was they actually looked at mice, and they basically partially disabled the immune system of these mice. And then they gave them the malaria parasite over the course of several weeks to see how the parasite would fare. And what was surprising is that this parasite actually got a lot stronger even though the mice had a weak immune system. It was growing faster. It caused more anemia and weight loss. It was just a much nastier parasite than it had been to start out with.

Interviewer – Sarah Crespi

So I still kind of want to know why did they ask this question? What are the implications of finding out that weakening immune system makes malaria more of a bad guy?

Interviewee – David Grimm

Well a lot of people with weakened immune systems live in places where malaria is a real problem. For example, AIDS patients are living longer if they self-compromised immune systems, and many of them live in Africa where malaria is rampant. And one study has already shown that HIV infection has resulted in a 20% increase in the number of malarial parasites, which would be a nice confirmation of this study suggesting that people with weakened immune systems may actually be more susceptible. Parasites might actually be getting stronger in these people. Same thing with, there's a lot of people out there that are taking immunosuppressing drugs or that have autoimmune diseases that can weaken their immune systems. So there's potentially a lot of people out there that this could be a real problem for, especially if this parasite is getting stronger despite the fact that we're getting weaker.

Interviewer – Sarah Crespi

So is there anything we can do about it?

Interviewee – David Grimm

Well, what it does is if this holds true in people, it really gives physicians this red flag to say, you know, just because you have a population of patients that have weakened immune systems, you can't ignore them or think that malaria is not going to be as harmful on them. You've got to pay as much attention, potentially more attention to them than you would with other patients.

Interviewer – Sarah Crespi

So what else is on the site this week, Dave?

Interviewee – David Grimm

Well, Sarah, for *ScienceNOW*, there's been a lot of press about what's happening in Lake Vostok. This is this Antarctic lake that's buried beneath the ice. Russian scientists have been drilling into it, and there's been a lot of speculation about what is going to be in that water. Is there anything living? One report last week suggests there might even be fish in the lake. We've got a very nice explainer telling you what's true and false about what's really going on in Lake Vostok. Also a story about how sharks stun sardines with slaps of their tail. For *ScienceInsider*, we've got a story about what the next Mars Rover might look like. Also a story about why the National Science Foundation is doing well despite the sequester that's happening in Washington, D.C. So be sure to check out all these stories on the site.

Interviewer – Sarah Crespi

Thanks, Dave.

Interviewee – David Grimm

Thanks, Sarah.

Interviewer – Sarah Crespi

David Grimm is the editor for *Science's* online daily news site. You can check out the latest news and the policy blog, *ScienceInsider*, at news.sciencemag.org.