

Transcript Details

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In Pursuit of Success Against HIV

WE HAVE LIVED TO SEE A VACCINE FOR POLIO AND SMALLPOX, WHAT'S SO DIFFERENT ABOUT AIDS?

Our presidential election is only days away. Forty eight million people in America are uninsured and healthcare costs are rising two to three times faster than our nation's GDP. Where will America's healthcare system be in five years? Welcome to ReachMD's monthly series focus on Public Health Policy. This month we explore the many questions facing healthcare today.

We have lived to see a vaccine for polio and smallpox, what's so different about AIDS? You're listening to ReachMD XM 157, The Channel for Medical Professionals. Welcome to the Clinician's Roundtable. I am your host, Dr. Maurice Pickard and joining me today is Dr. Anthony Fauci. Dr. Fauci is Director of the National Institute of Allergy and Infectious Disease at the National Institute of Health and the recent recipient of the Presidential Medal of Freedom as well as a leading architect of the United States President's Emergency Plan for AIDS Relief.

DR. MAURICE PICKARD:

Thank you very much for joining us.

DR. ANTHONY FAUCI:

Good to be here.

DR. MAURICE PICKARD:

We have looked forward to the appearance of the vaccine for AIDS. All of us were really disappointed in 2003 when the research stopped on a particular vaccine. Could you tell me what is the problem? Why are we having this particular difficulty?

DR. ANTHONY FAUCI:

Well, I think it can be simply said that the major problem on the road to an HIV vaccine is that HIV is really quite different from any other microbe, any other virus that we've had to confront, and let me give you a pretty simple example. Even with very difficult diseases that cause death and suffering like smallpox and polio and measles and disease like that, the body in its natural response to the virus gives you a big clue to how you can develop a vaccine because despite the suffering and the death, the body naturally responds favorably and recovers from smallpox, from polio, from measles; in the vast majority of cases gets rid of the virus completely and leaves the body with protection against subsequent challenges, so when you're trying to design a vaccine against these diseases, against these viruses,

you use natural infection as your model because natural infection has already done the experiment to prove it to you that it is not only feasible, but highly likely that you'd be able to induce such a response by vaccinating the person with a proper immunogen. Unfortunately, and to our great dismay, this is not the case with HIV because in the natural setting when a person is infected with HIV, they do not mount an adequate or an appropriate immune response against the virus that is able to (a) control the virus; it continues to replicate and in the vast, vast majority of people have a progressive and relentless course and certainly the immune system does not eliminate the virus in the sense of eradicating it the way it does with smallpox and the way it does with polio and so we don't have any guidepost, we don't have any correlates of immunity that are naturally occurring and it's saying among vaccinologists that the best vaccine is natural infection because it marshals all of the appropriate response. With HIV, natural infection doesn't do that, so if we are going to develop a vaccine for HIV, we've got to do better than what natural infection does, and that's been very, very difficult because the body doesn't readily develop neutralizing antibodies or a cell-mediated immune response against HIV in contradistinction to what it does with virtually every other virus.

DR. MAURICE PICKARD:

Is this because the virus goes through a mutation or does it hide itself inside the CD4 cells and therefore our immunologic system doesn't recognize it?

DR. ANTHONY FAUCI:

Well, the answer to the question is we do not know for sure, but it's likely several issues including the two that you mentioned. Importantly, the part of the virus that a neutralizing antibody would bind to and hence which you would hope it would show itself to the immune system in a way that induces neutralizing antibody is what we call cryptic. It's in a conformational form where it doesn't readily reveal itself to the immune system. Its shape is very difficult for the immune system to recognize. It's covered with a bunch of sugars that prevent various antibodies from accessing it. It is a very, very structurally difficult immunogen to get a neutralizing antibody against, that's the first thing. The other is what you mentioned about the fact that the virus readily and rapidly mutates. The diversity among HIV is far greater than anything that we have seen with any other virus, and also as you mentioned, the virus tends to almost invariably as part of its replication cycle, a small percentage of the infected cells will go into a latent form in which it integrates itself and stays there hidden from the body's immune system recognition mechanism, so there are a bunch of reasons why that the problem is very, very severe.

DR. MAURICE PICKARD:

That latency happens very early in the viremia, is that correct?

DR. ANTHONY FAUCI:

Very early, literally within days. We've actually showed that in our own group and others have shown that also that when someone is infected with HIV and you get them and are able to examine them in the acute stage of disease, you see that already literally within a couple of weeks, probably within days, this reservoir is established and it has been very difficult and up to this point impossible to eradicate that reservoir.

DR. MAURICE PICKARD:

What's at the cutting edge to help prevent further pandemic that exists in our world.

DR. ANTHONY FAUCI:

That is really the \$64,000 question that was discussed at the meeting in Mexico City in early August and that is prevention, prevention, prevention. They are many effective ways to prevent HIV. It is in most cases an entirely preventable disease, particularly in the situation of sexual contact and injection drug use. The problem is that behavioral change is very difficult, particularly when it's ingrained in the cultures and traditions of different societies. We've got to get the proven preventive measures available to people in counseling as well as in the certain practical medical means; there are behavioral changes and there are biological things that can be done. It is very, very clear that circumcision is protective to the point of about 50-65% protective in individuals from acquiring infection if in fact they are circumcised. Also needle exchange programs for people who are injection drug users. There is effective mother-to-child transmission blocking by treating the mother as well as infant soon after birth; those are biological bases. Topical microbicides, we have not yet been successful in using that as a preventive measure. We don't have a successful vaccine, but there are things that can be done; condom distribution and the availability of condoms for people who could use them to prevent HIV infection. There was a figure that was discussed in the latest UN AIDS report which is disturbing of the proven preventive measures anywhere between 8 and 20% of the people, which means that 80 to 92% of the people do not have availability for these measures. So if you look at the accessibility of preventive measures and go through the list of high-risk people or people who are at risk because of their behavior or what have you, as I mentioned, only 8 to 20% of those people have accessibility to these proven methods. We've got to do much, much better than that. So that was an area of great emphasis at the meeting in Mexico City, is strengthening of prevention measures, both our behavioral prevention measures as well as our biologically involved preventive measures.

DR. MAURICE PICKARD:

Since so many of the people who are in our audience are primary care physicians, is this the message you would give them and how would expand on that?

DR. ANTHONY FAUCI:

Well, first of all, the most important thing that someone who is in practice can do is take out of the closet, take the stigma away from discussing HIV infection and make HIV testing a routine part of routine medical care, instead of being something that you explicitly start discussing; we are going to do an HIV test, you have any objection to that, and that what the CDC is recommending to making it a part of routine medical care and the reason for that is that for the over _____

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