MODERN ASPECTS OF CANDIDOSIS VACCINES PRODUCTION

Esther Nakimera, Ozojiofor Chidinma
National University of Pharmacy, Kharkiv, Ukraine
sesta_pet20@ymail.com

Introduction. Candida Albicans is the most common type of yeast infection found in the mouth, intestinal tract, vagina and it may affect the skin and other mucous membranes. If the immune system is not functioning properly, the candida infection can migrate to other areas of the body including the blood and membranes aroung the heart. Candida is a fungus that aids with nutrients absorption ad digestion when in proper levels in the body. By far the most common causes of invasive fungal infections are members of the genus *Candida*. Candida Albicans is one of the more common fungal pathogens that can colonise skin and mucous membrane all over the body and while normally harmless, can cause candidiasis or thrush infections like vaginitis. If the fungus enters into the bloodstream and streads around the body, it becomes life threatening in some cases. There are many other types of fungal infections which can be just as harmful and are also increasing in prevalence globally.

The causes of Candida infections can include; birth control pills, oral corticosteroids, cancer treatments, diabetes, weakened immune system, broad spectrum antibiotics.

The symptoms can include; chronic fatigue, sinus infections, mood disorder, intestinal distress, recurring vaginal and urinary tract infections, oral thrush, brein fog skin and nail fungal infections, hormonal imbalance.

Aim. Analyze existing development of drugs for the prevention of candidiasis.

Results and discussion. There have been different vaccines strategies for active immmunisation and two have gone through phase 1 of clinicaltrials against C. Albicans. An active vaccine is created containing a live attenuated strainof C.Albicans with an adjuvant chemical the helps stimulate the required immune response. This allows production of antibodies against the fungal antigens in the vaccine and induces protection against the infection. Active vaccination ai not ideal for immune suppressed patients as their immune system is not strong enough to produce the antibody response seen in healthier individuals. Another passive form of immunisation would need to be developed for these individuals. A live attenuated vaccine called rAls3p-N has been deeloped and was recently tested in humans after positive findings inmice and primates. It demonstrates a high immune response leading to antibody production to fight C.Albicans infection, preventing vaginitis. In human trials, 30 subjects were administered 2 increasing doses of vaccine and no side effects were reported. The increased immune response suggests this vaccine proides

protection against C.Albicans. Another active vaccine Sap2p that prevents vaginitis caused by C.Albicans has also gone through Phase 1 trials and shows tolerability and efficacy in humans. Trials of other vaccines in mouse models have shown promising data. One problem with using mice is that they have a very different immune response to candida. Unlike mice, humans exposed to Candida develop immune responses early in life, so primate models may be better models for human infections.

Table

Strategies of two vaccines currently in clinical development

VACCINE IN DEVELOPMENT	TREATMENT	ADDITIONAL INFORMATION	PHASE 1 HUMAN TRIALS
rAls3p-N	Active vaccine for vaginitis caused by C. Albicans. Also targets skin and soft tissue infections in S. aureus.	In mice and primates, demonstrated an increased response of immune cells and antibody production to fight infection.	30 subjects were given two doses of the vaccine. No adverse side effects were reported.
Sap2p	Active vaccines for vaginitis caused by C. Albicans. Contains a genetically modified protein called SAP.	Delivered into body in a virus particle. Intravascular and intravaginal infections have been developed.	Well tolerated vaccine and effective at low doses.

Conclusions. There are still challenges yet to overcome associated with the high cost and risks of developing a vaccine. Gaining the technical skills requires to manufacture, store and transfer live vaccines is required. Preparing antigens for use in human studies may require further evidence, for regulatory authorities such as Food and Drug Administration in the US to approve and accelerate the vaccine development. Further exploitation into gaining data in humans will promote this exciting research area.