



Tackling scab requires a whole-industry approach

We used the technique described in our earlier letter to develop an IB vaccine, which we introduced successfully in Myanmar in 1994. We used bronchial tissue lysate from a pullet that had died of nephrogenic IB infection and serum from infected laying hens from the same farm. We transformed *Pasteurella* and produced an inactivated alum-precipitated vaccine within two weeks.

Over 9000 birds were then vaccinated. This not only reduced deaths in young birds but also increased egg production in laying birds within a few days.

The vaccine has proven to be very successful when used both prophylactically and therapeutically, with established widespread, repeated uptake. IB usually presents as a respiratory disease but the virus can spread to infect the oviduct. This is followed by laying of soft-shelled eggs and a drop in egg production. There has been regular feedback from vets and farmers that therapeutic application of the vaccine following respiratory signs accelerates recovery and improves egg production in laying hens. Farmers in Myanmar call the vaccine U Toe Say, which translates as 'egg promotion vaccine'. This evidence from the vets and farmers is only empirical, but is strong and consistent over 25 years.

As the therapeutic effect is not proven to be the result of a simple antigen/antibody interaction, could the vaccine also block virus receptor sites?

Covid-19 is caused by SARS-CoV-2, a *Betacoronavirus*. Antibody in convalescent plasma is considered useful in treating Covid-19.¹ Killed bacterial vaccines primarily induce humoral immunity. We wonder if the administration of a vaccine containing formalin-killed *Pasteurella multocida* cells, prepared as we described, could be effective in therapy if administered early in the course of the disease, by stimulating the production of specific protective antibodies. In an early study in China, the median time from initial symptoms to death was 14 days (range 7–41 days),² so this would mean that there is time for a vaccine to take effect.

SARS-CoV-2 virus invades the intestines, and diarrhoea and

dehydration is a feature in many hospitalised patients.³ Combination of some of the virus' genes with *Lactobacillus acidophilus*, using our method, could potentially produce an effective oral live vaccine in a few weeks if all went well.

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- 2 Wang W, Tang J, Wei F. Updated understanding of the outbreak of 2019 novel coronavirus (2019-nCoV) in Wuhan, China. *J Med Virol* 2020;92:441–7
- 3 Gu J, Han B, Wang J. COVID-19. Gastrointestinal manifestations and potential fecal-oral transmission. *Gastroenterology* 2020; doi: 10.1053/j.gastro.2020.02.054

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CORONAVIRUS

Possible treatment of Covid-19 with a therapeutic vaccine

FURTHER to our recent letter (*VR*, 28 March 2020, vol 186, p 388), readers may find the following of interest.

Avian coronavirus (a *Gammacoronavirus*) is a highly infectious avian pathogen which can infect the respiratory system, intestine, kidneys and reproductive system of birds. It is the cause of infectious bronchitis (IB), an important disease of poultry.

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