Efficacy of YURVAC® RHD vaccine against RHDV2 strain in the presence or absence of maternally derived antibodies

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Introduction

YURVAC® RHD is a new recombinant vaccine intended for the active immunisation of rabbits from the age of 30 days to reduce mortality caused by classical Rabbit Haemorrhagic Disease (RHDV) and the variant (RHDV2). The vaccination schedule includes one single dose administered by subcutaneous route to rabbits from 30 days of age. In 2010, a variant of the virus (RHDV2) emerged spreading worldwide within a short period of time and showing higher prevalence than RHDV isolates in kits and adult rabbits. But one of the most relevant characteristics of this pathogen is to cause disease in kits[1]. Vaccination is the main prevention measure against RHD. The vaccination strategy has allowed the control of RHDV2 disease, showing early protection against mortality after experimental challenges[2,3]. YURVAC® RHD vaccine has been developed with the intention of protect against both RHDV2 and RHDV in one administration.

The aim of this study was to demonstrate to which extent MDAs against RHDV2 could have an impact on the efficacy of YURVAC® RHD vaccine in 30-day-old rabbits by means of challenge. The design of the study was based on the current edition of the Ph. Eur. monograph no. 5.2.7[4] and the "Reflection paper on the demonstration of a possible impact of maternally derived antibodies on vaccine efficacy in young animals (EMA/CVMP/IWP/439467/2007)"[5]. As the study was using the RHDV2 strain, the requirements established in the specific monograph 2325 "Rabbit Haemorrhagic Disease Virus (Inactivated)" such as the minimum age of the animals or the percentage of mortality could not be followed, so were adapted to the specific case.

Material and Methods

Seventy rabbits of 30 days of age, were included. At day 0 of the study, one group of 25 rabbits free from RHDV2 antibodies (MDA-) (group A , YURVAC® RHD MDA-) and another group of 20 rabbits with RHDV2 antibodies (MDA+) (group B, YURVAC® RHD MDA+) were vaccinated subcutaneously (SC) with YURVAC® RHD, while the other group of 25 rabbits with RHDV2 antibodies (group C, Control MDA+) received sterile PBS SC.

In order to demonstrate the absence of interference by MDAs on the vaccine administration, animals were challenged with an RHDV2 virulent strain on day 40 once the MDAs had decreased in control group C.

Mortality after challenge was recorded throughout all the study in both cases, and the proportion of animals that died per group were analysed with a Chi-square test.

Serological response was evaluated by hemagglutination inhibition technique for the detection of antibodies against RHDV2 on different days in order to detect the decay of antibodies in the control group.

Results

The results in mortality showed a 100% survival rate in the group A (YURVAC® RHD MDA-) and a 92% survival rate obtained in the group B (YURVAC® RHD MDA+), confirming that maternally derived antibodies do not interfere in the efficacy of YURVAC® RHD vaccine as not statistically significant differences were observed (*Figure 1*). On the other hand, the 44% mortality obtained in the group C (Control MDA+) confirms that the infection was properly performed.

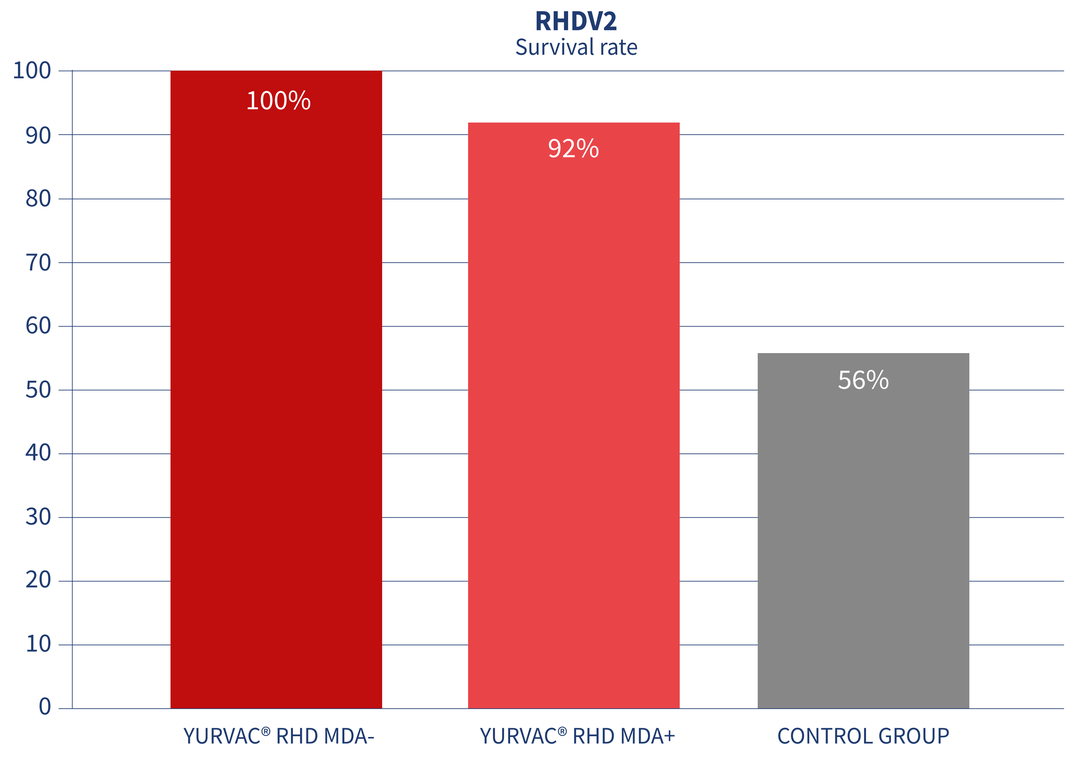

Figure 1: Percentage survival rate after RHDV2 challenge.

Regarding the serology results, at the day of challenge, the control group were seronegative or presented low MDA levels against RHDV2.

Conclusions

The results obtained in these trials fully support that the efficacy of YURVAC® RHD in animals vaccinated in presence of MDAs against RHDV2 in 30-day-old rabbits is the same as that obtained in animals vaccinated in the absence of MDAs. Thus, MDAs do not interfere with the vaccine efficacy.

References

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