Scoping Review on the progress of vaccination against fasciolosis: past, present and future perspectives

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emop 2021 XIII Belgrade — changing climate changing parasites

POSTER ID: FWB2

INTRODUCTION

Fasciolosis is a worldwide foodborne trematodosis caused by platyhelminthes from the Fasciolidae family. Its treatment is based on the use of triclabendazole. Nevertheless, its continued use has propagated the emergence of resistance against it. For that reason, the development of an effective vaccine is of paramount importance. Through a Systematic Scoping Review based on PRISMA guidelines, we analyse the progress of vaccination trials against *Fasciola* spp. in the last 20 years, with the aim of providing homogeneity to the available data and proposing strategies that could guide the future steps in this research area.

MATERIAL AND METHODS

Identification

Records identified through searching in **PubMed** and **Web of Science Core Collection** databases

n = 1205

Screening

Records after removing duplicates

n = 805

Elegibility

Records after applying exclusion criteria:
1st – Non-English publications
2nd – Review articles
3rd – not related to the scope of this review

n (1st) = 777 **n (2nd) = 660** **n (3rd) = 110**

Inclusion

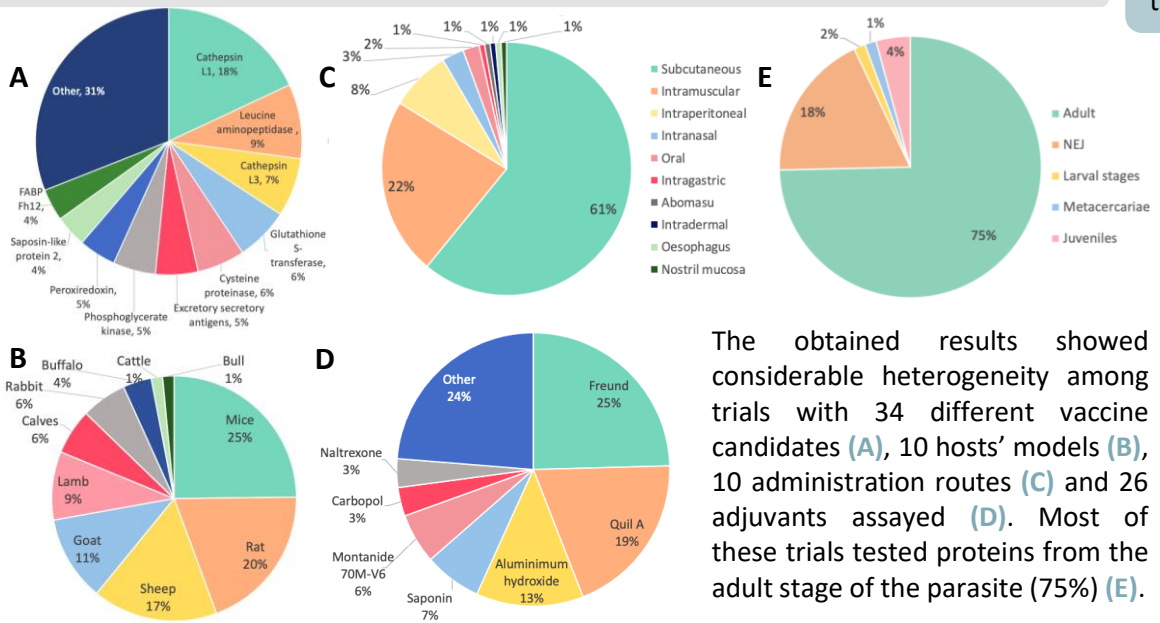
Records included in the analyses

n=76

PubMed WEB OF SCIENCE

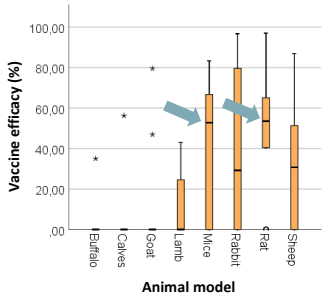
Search strategy: *(fasciol*"[All Fields] OR "liver fluke"[All Fields]) AND ("vaccin*"[All Fields] OR "immunogen*"[All Fields] OR "protect*"[All Fields]) AND 2000/01/01:2020/12/31[Date - Publication]*

RESULTS

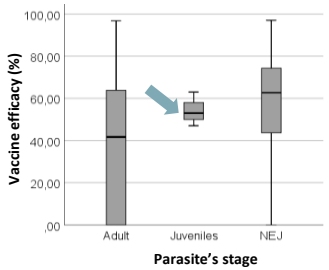


The obtained results showed considerable heterogeneity among trials with 34 different vaccine candidates (A), 10 hosts' models (B), 10 administration routes (C) and 26 adjuvants assayed (D). Most of these trials tested proteins from the adult stage of the parasite (75%) (E).

Obtained **protection** percentages ranged from **23.1 to 97%**, although up to 48.5% of trials did not reach significant reduction of parasite burdens.

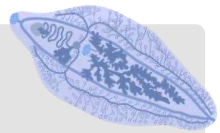


Murine and mice models, the most used ones, had the highest medians in terms of vaccine efficacy. However, they have been described as "not ideal models" for the study of fasciolosis in comparison to studies in larger herbivorous mammals.



Despite the lack of statistically significant differences, vaccination trials that included antigens from early stages of the parasite reported more homogeneous efficacy data in comparison to adult stages.

CONCLUSIONS



1. High variability in the protection rates and partial success have been reported in the analysed studies.

2. As a result, homogeneous criteria should be established, as well as other approaches, including a better knowledge of the host/parasite relationships at an early stage of fasciolosis, which should lead to a more rational selection of vaccine candidates.