

Bacterin Induced Pathogenic Lapin and Murine Cryoglobulins

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Abstract

The nature of the mammalian humoral immunoglobulin responses to antigens in general are either one or more than one of the followings; mono-partite [normoglobulin], dipartite [normoglobulin, cryoglobulin] and /or tripartite [normoglobulin, cryoglobulin, pyroglobulin]. While for bacterin it can be monopartite [normoglobulin], dipartite [normoglobulin, cryoglobulin]. Three experimental settings have been adopted. Bacterin induced cryoglobulin responses in turn may induce cryoglobulin specific pathogenic potentials as that noted in cases of BCG [pneumogenic, nephritogenic, lymphogenic and granulomatogenic] and Salmonella typhi [pneumogenic, nephritogenic, lymphogenic] bacterin induced cryoglobulin in lapin and murine laboratory animal models. Such pathology is standing as interfering side effect in the preclinical experimental vaccine evaluation studies. Bacterin during vaccination programs might be of potential cause for cryoglobulin induced pathogenicity in vaccine.

Keywords

Antigen; Bacterin; Cryoglobulin; Interference; Preclinical

Introduction

The systemic humoral mammalian immune responses to antigens (Table 1) span between normoglobulin, cryoglobulin and / or pyroglobulin [1,2]. While for bacterins it can be normoglobulin and / or cryoglobulin [3,4]. The objective of the present opinion was to affix cryoglobulin induced pathology as a consequence of bacterin immunization.

Experimental Settings

Three experimental settings have been adopted;

Setting I: BCG induced, S. typhi induced and B. melitensis induced in a lapin animal models [3,5,6]

Setting II: S. typhi induced cryoglobulin mediated pathology in lapin models [7]

Setting III: Human tuberculosis cryoglobulin induced pathology in murine model [8]

Immunofixation

The immunofixation studies have shown mixed cryoglobulinemia of IgM-IgG-IgA in typhoid vaccine and typhoid patients (9) and mixed two variant cryoglobulin responses were noted among Brucella patients as IgM-IgG-IgA and IgM-IgG (Table 2) responses [10].

Pathogenicity

It has been found that human and lapin S. typhi cryoglobulin was pneumogenic, nephritogenic, and lymphogenic in rabbits model [7]. While human tuberculosis cryoglobulin was pneumogenic, nephritogenic, lymphogenic and granulomatogenic (Table 3) in murine model [8].

Boosting

The adopted bacterin priming for rabbit and mice depends on a starting dose then two successive boosting dose at a week a part. It has been found that the more exposure to bacterin the more cryoglobulin producing and the more cryoglobulin pathogenicity [7,8].

Response type	Response Nature for antigen	Response nature for bacterin
Monopartite	Normoglobulin	Normoglobulin
Dipartite	Normoglobulin, Cryoglobulin	Normoglobulin, Cryoglobulin
Tripartite	Normoglobulin, Cryoglobulin, Pyroglobulin	

Table 1: Systemic Humoral immune responses to antigens and bacterins [1,2]

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Human Disease Type	Cryoglobulin Nature	References
Typhoid Vaccine ,Typhoid Patients	IgM-IgG-IgA	[9]
Brucella Pre-immune, Brucella Patients	IgM-IgG-IgA ,IgM-IgG	[10]

Table 2: Cryoglobulin Isotypes in human Patients

Animal Model	Cryoglobulin Source	Pathogenicity
Lapin	Human, Lapin	Pneumogenic, Nephritogenic, Lymphogenic [7]
Murine	Human	Pneumogenic, Nephritogenic, Lymphogenic, Granulomatogenic [8]

Table 3: Cryoglobulin Pathogenicity (11).

Evaluation Parameters	Interference
I-Cell culture Studies	
Safety	-
Antigenicity	-
Laboratory Animal Studies	
Safety	+
Antigenicity	-
Immunogenicity	-
Immune Protectivity	-

Table 4: Preclinical Evaluation of Bacterins and limits of Cryoglobulin interference [12]

Mechanism

Bacterin specific immune-priming induced normoglobulin and cryoglobulin responses. Cryoglobulin in turn induced specific pathogenicity [7,8].

Interference

Bacterin induced pathogenicity may interferes with safety (Table 4) parameter of vaccine candidate preclinical evaluation parameters in laboratory animal level.

Conclusion

Bacterins on specific immune priming of lapin and murine animal models produce, normoglobulin and cryoglobulin responses. Allogenic and xenogenic cryoglobulin has been found to be pneumogenic, nephritogenic and lymphogenic. A point to be noted when any candidate bacterin is going to be evaluated in laboratory animal models for approval to human health welfare.

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