Short communication

SHARED ALLERGENICITY IN A LAPIN-MODEL OF DELAYED HYPERSENSITIVITY TO GRAM-NEGATIVE PROTOPLASMIC SONICATE PROTEINS

Abstract

There were shared allergenicity in delayed type hypersensitivity between the protoplasmic sonicate proteins (PSP) of Pseudomonas aeruginosa with that of Klebsiella oxytoca. Mild erythema was noted from 6 to 72 hrs post to injecting P. aeruginosa PSP [PAPSP] in Klebsiella oxytoca PSP (KOPSP) primed rabbits. Mild, moderate to high erythema during 6 up to 72 hrs post to injecting KOPSP in PAPSP primed rabbits. Induration of 5 mm at 72 hrs of PAPSP intradermal (ID) injection in KOPSP primed rabbits. While induration of 6 to 12 mm of KOPSP ID injected to PAPSP primed rabbits. Consequently, there was a high quantitative and/or potency of the allergenic fraction of KO than that of PA.

The shared fractions were characterized, as;

i – the epitope was in the intracellular protein, ii – produces variable degrees of erythema and induration but not necrosis in 72 hrs post-injection of the sensitins in immune primed rabbits, iii – express quantitative and/or potency differences among different preparations, iv – the delayed allergenicity of this epitope was of bilateral or reciprocal type and v – of delayed allergenic nature.

Such findings appeared to be novel contribution in bacterial protein allergens, with possible pan shared preserved protein fraction between these two different gram-negative representatives of bacterial families.

Keywords: primed rabbits, allergenicity, immunogenicity, bacterial proteins

Introduction

Bacterial antigens (BAG) may express shared antigenicity (SHAG), shared immunogenicity (SHI) and /or shared allergenicity (SHALL). These sharing fractions can be of quality, quantity and /or potency. Unilateral or bilateral and reciprocal or non-reciprocal nature [1-8]. The present short communication aimed at presenting

shared delayed skin hypersensitivity between the intracellular proteins of two different gram-negative bacteria.

PSP from *P. aeruginosa* and *K. oxytoca* were prepared, partially purified, identified and quantified as an intracellular bacterial proteins as in [10]. The concentration of PAPSP was 2.71 mg/ml. and that of KOPSP was 1.81 mg/ml. The test immunogens were PAPSP + FCA and KOPSP + CFA for *P. aeruginosa* and *K. oxytoca*, respectively. Specific immune priming of rabbits with test immunogens made as in [11]. DTH skin test done and read as in [12].

Materials and method

The ID injection of 0.1 ml. PAPSP sensitin in PAPSP specific immune primed rabbits was showing mild, moderate and high erythema reaction lasted from 6 up to 72 hrs. The induration reaction was evident at 48 hrs and 72 hrs post-injection of the sensitin as 10 and 18 mm, respectively. This accounts for the homologous delayed hypersensitivity reaction. While the ID injection of PAPSP to KOPSP specific immune primed rabbits showed mild erythema reaction lasted from 6 up to 72 hrs post-injection of the sensitin. The induration reaction was evident at 72 hrs post-injection of the sensitin as 6 mm around the injection site. This accounts for the shared allergenicity in skin DTH reaction, Table – 1.

Table- 1: Rabbit skin DTH reaction to PAPSP and shared reaction to KOPSP.

Duration of reaction in hrs	PAPSP in PAPSP primed	PAPSP in PAPSP primed	PAPSP in PAPSP primed	PAPSP in KOPSP primed	PAPSP in KOPSP primed	PAPSP in KOPSP primed
	E	I	N	E	I	N
6	+	-	-	+	-	-
48	++	10 mm	-	+	-	-
72	+++	18 mm	-	+	6 mm	-

Results and discussion

The ID injection of 0.1 ml of KOPSP in KOPSP specific immune primed rabbits was showing an erythema reaction of mild nature as (+) for the duration of time lasted from 6 up to 72 hrs post-injection of sensitin with nill induration reactions. This accounts for the homologous DTH reactions. While the ID injection of 0.1 ml of KOPSP

to PAPSP specific immune primed rabbits has shown mild, moderate to high erythema reaction lasted from 6 up to 72 hrs, respectively. Induration reactions were apparent in 6 mm for 48 hrs and 12 mm for 72 hrs post-injection of sensitins. This accounts for shared DTH reactions with nill necrosis reactions were evident in table, (Table – 2).

Table – 2: Rabbit skin DTH reactions to KOPSP and shared reactions to PAPSP

Duration of DTH reaction in hrs	KOPSP in KOPSP primed	KOPSP in KOPSP primed	KOPSP in KOPSP primed	KOPSP in PAPSP primed	KOPSP in PAPSP primed	KOPSP in PAPSP primed
	E	I	N	E	I	N
6	+	-	-	+	-	-
48	+	-	-	++	6 mm	-
72	+	-	-	+++	12 mm	-

Results tabulated in Tables 1 and 2 indicate that there was bilateral shared DTH allergenicity between PSP proteins of P. aeruginosa and K. oxytoca and the nature of this shared allergenicity be of quantitative rather than qualitative. In which K. oxytoca PSP shared allergenicity was more in quantity than that of P. aeruginosa PSP in rabbit models.

Changes in the conformation of the allergenic epitopes are mostly, paralleled by changes in the nature of their allergenic responses [2]. Protein allergens expressed potential risk for cross-reactivity [3]. Modification of corticosteroid from their original core structure may frequently lead to cross-allergenicity to the new form of the corticosteroid [4]. Three patterns of cross-allergenicity to proton pump inhibitors were indicated [5]. T cells are taking part in the DTH to quinolones reactions and cross-reactivity to other quinolones [6]. Human adenovirus serotypes express cross-reactivity in inducing DTH [7]. Leukocyte migration inhibition to various cepham antibiotics displayed cepham shared allergenicity in DTH reactions [8].

Bacterial antigenic epitopes can be with an array of immune potentials such as; immunogenic, autoreactive, immunosuppressive, and/or delayed type hypersensitivity inducing nature [9]. There were marked shared reactivity of burilin of M. ulcerans to tuberculin PPD of M. tuberculosis as indicated by the induration upon intradermal injection. So that, burilin positive patients when analysed in conjugation with either the presence of BCG scar or retesting of BCG vaccination,12 of 14 BCG

vaccinated burilin patients were burilin positive and 6 of the 12 were also PPD positive [13]. It had been reported that there were cell mediated immunity cross reactions of various species of mycobacteria that had been attributed to polymorphism of target bacterial antigens [14].

Conclusion

The present study focusing onto sharing in delayed hypersensitivity inducing epitopes from intracellular proteins of P. aeruginosa and K. oxytoca with rather difference in quantity of the allergenic fractions. Both of which produce erythema and induration to variable degrees with absence of necrosis up to 72 hrs post to sensitin injection through ID route. The shared delayed hypersensitivity induced by intracellular bacterial protein mapped functionally in this short communication, can be characterized as in the followings;

i – The shared allergenic epitope is in or on protoplasmic sonicate protein with an intracellular location with possible oligo amino acid sequence nature;

ii – Function; as delayed type allergen.

iii – Response; produces erythema and induration but not necrosis.

iv – Express quantitative differences among different protoplasmic sonicate proteins.

v – This shared allergenic epitope is of bilateral reciprocal nature.

vi – Attributed to T cell dependent hypersensitivity reactions [1,12].

vii – Such sharing delayed allergenic epitopes between bacteria that belongs to different gram-negative families. It might be a pan shared preserved protein fraction, which may stands as a novel finding.

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