Asian Journal of Immunology

Volume 7, Issue 1, Page 181-184, 2024; Article no.AJI.123083

Shared Allergenicity in a Lapin-Model of Delayed Htpersensitivity to Gram Negative Protoplasmic Sonicate Proteins PSP

Ibrahim M S SHNAWA [a,b*], ALGebori HSH [c] and Thewaini Q N [d]

[a] Department of Medical Biotechnology, College of Biotechnology, AL-Qasim Green University, Qasim, Iraq.
[b] College of Nursing Technology, University of Hilla, Iraq.
[c] Department of Basic Sciences, College of Dentistry, Babylon University, Iraq.
[d] Department of Medical Biotechnology, College of Biotechnology, AL Qasim Green University, Iraq.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: https://doi.org/10.9734/aji/2024/v7i1142

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/123083

Short Research Article

Received: 07/07/2024
Accepted: 10/09/2024
Published: 20/09/2024

ABSTRACT

There were shared allergenicity in delayed type hypersensitivity between the protoplasmic sonicate proteins of Pseudomonas aeruginosa with that of *Klebsiella oxytoca* Mild erythema was noted from 6 to72 hrs post to *P. aeruginosa* (PSP) in *Klebsiella oxytoca* PSP primed rabbits (KOPSP). 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 injecting in KOPSP primed rabbits. While

**Corresponding author: E-mail: ibrahimshnawa3@gmail.com;*

Cite as: *SHNAWA, Ibrahim M S, ALGebori HSH, and Thewaini Q N. 2024. "Shared Allergenicity in a Lapin-Model of Delayed Htpersensitivity to Gram Negative Protoplasmic Sonicate Proteins PSP". Asian Journal of Immunology 7 (1):181-84. https://journalaji.com/index.php/AJI/article/view/142.*

induration of 6 to 12 mm of KOPSP ID injected to PAPSP primed rabbits. Consenquently there was a high quantitative and /or potency of the allergenic fraction of KO than that of PA. The shared fractions were characterized as delayed allergenicity of bilateral or reciprocal type delayed allergenic nature. Such findings appeared to be novel contribution in bacterial protein allergens, with possible pan shared bacterial families. Preserved protein fraction between these two different gram negative representatives of bacterial families.

Keywords: Bacterial antigens; shared antigenicity; shared immunogenicity.

1. 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 potencey. Unilateral or bilateral and reciprocal or non-reciprocal natuere. Shared immunogenicity showed a dual importance in clinical practice of human microbial infections. First it has cross-protection ability that is crucial in immunoprophylaction of infectious diseases. Sceond it is problematic in the immunodiagnosis of these diseases. Though, shared allergenicity stands as problematic issue in diagnosis and managment of human infectious diseases [1-8]. Thus, the present short communication was aimed at presenting shared delayed skin hypersensitivity between the intracellular proteins of two different gram negative bacteria.

2. MATERIALS AND METHODS

PSP from *P. aeruginosa* and *K. oxytoca* were prepared, partially purified, indentified and quantified as an intracellular bacterial proteins as in [9]. 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 were made as in [10]. DTH skin test was done and read as in [11]. Homologous skin DTH reactions scored as homologous sentisitins injected in rabbits primed with homologous protein. While heteologous shared DTH skin reactions were checked when heterologous sensitins injected in rabbits primed with heterologous proteins [11].

3. RESULTS AND DISCUSSION

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, Table 1 A1. While the ID injection of PAPSP to KOPSP specific immune primed rabbits has 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 B-1.

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 Table 1 /A-2. While the ID injection of 0.1 ml of KOPSP to PAPSP specific immune primed rabbits showed mild, moderate to high erythema reaction lasted from 6 up to 72 hrs respectively Table 1/ B-2. 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 . Results tabulated in Table 1 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 change in 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

Table 1. Shared heterologous rabbit skin DTH as compared to the homologous rabbit skin DTH reactions

Nature of skin DTH/reactions per hours	Erythema	Induration in mm	Necrosis
A – 1/Homologous PASP in PAPSP primed rabbits			
6	+	-	-
48	++	10	-
72	+++	18	-
A -2/Homologous of KOPSP in KOPSP primed rabbits			
6	+	-	-
48	+	-	-
72	+	-	-
B-1./Heterologous PAPSP in KOPSP primed rabbits			
6	+	-	-
48	+	-	-
72	+	6	-
B -2/Heterologous KOPSP in PAPSP primed rabbits			
6	+	-	-
48	++	6	-
72	+++	12	-

express cross-reactivity in inducing DTH [7]. Leukocyte migration inhibition to various cepham antibiotics displayed cepham shared allergeninicity 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 [12]. 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 taget bacterial antigens [14].

4. CONCLUSION

The present short communiction was focusing onto sharing in delayed hypersenitvity inducing epiopes 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. Shared delayed hypersensitivity induced by intracellular bacterial protein that was functionally mapped in this short communication can be characteized as in the followings;

1. The shared allergenic epitope is in or on protoplasmic sonicate protein with an intracellular location with possible oligo-amino acid sequence nature.
2. Function as delayed type allergen.
3. Response produces erythema and induration but not necrosis.
4. Express quantitative differences among different protoplasm sonicate proteins
5. This shared allergenic epitope is of bilateral reciprocal nature.
6. Attributed to T cell dependent hypersensitivity reactions, [1,12].
7. 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 finiding.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Authors hereby declare that NO generative technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during writing or editing of this manuscript.

CONSENT

It is not applicable.

ETHICAL APPROVAL

The care, housing, handing and experimentation on rabbits were done following the international acts regulating care, housing, hnadling and intervention.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Shnawa IMS. Serology of Vibrio cholerae; Revisting, SSE, UK; 2023.
2. Seider CA, Zeindl R, Fernandez-Quintero M, et al. Allergenicity and conformational diversity of allergens. Allergies. 2024;4:1-16.
   DOI: 10.330
3. Gulec FEM, Caliskaner Z, Ozturk S, et al. Is allergenic similarity predictable in respratory allergens. Allergol. Immunopathol. 2008;36(2):5-65.
4. Allergen Online. Allegenic cross – reactivity. Home of FARRP allegen protein database. University of Nebraska-Lincoln. Allegen Online. 2023;22:1-6.
5. Berbegal L, Deleon FJ, Silvestre JF. Hypersensitivity reactions to Corticosteroids. Acats Dermosifitiogr. 2016;107(2):107-115.
6. Lombardo C, Ponadonna P. Hypersensitivity reactions to proton pump inhibitors. Drug Allergy. 2015;2:110-123.
7. 7-Schmid DA, Depta JPH, Pichler WJ. T cell mediated hypersensitivity to quinolones; mechanisms and cross-reactivity. Cli. Exp. Aller. 2005;36(1):59-69.
8. Bakay M, Szalay K, Beladi. Cross-reactivity bewtween human adenoviruses in delayed type hypersensitivty. APMIS. 2005;113(3):197-202.
9. Bjorn MJ, Iglewski BH, Ives SK, et al. Effect of iron on yields of exotoxin A in culture of Pseudomonas aeruginosa PA-103. Infection and Immunity. 1978;19(3): 785-791.
10. AL Shahery MAN, Shnawa IMS. Immunological adjuvani city of Sunflower oils; 1989.
11. Burrell R. Experimental Immunology, Burgess Publishing CO. Amazon, USA. 1979;102.
12. Uno K, Yamasaku F. Structural correlations with cross-reactivity of Beta-Lactam antibiotics in delayed type hypersensitivity: Cross-allergenicity in hypersensitivity to cephems with a tetrazolyl group in the C3 side chain J. Antimicrobial. Chemotherap. 1989;24(2): 251-264.
13. Dobos KM, Spotts EA, Marston BJ. Serologic responses to culture filtrate antigen of *Mycobacterium ulcerans* during *Burili ulcer* disease. Emergent Infectious Disease. 2000;6(2):158-164.
14. Kulkarini S, Hattikudur S, Kamat RS. Cell mediated immunity cross reactions of mycobacteria: Polymorphism of target bacterial antigens. Cli. Exp. Immunol. 1986;63:111-117.

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/123083