Transfer Factors as an Immunenhancer Against Adenovirus in Experimental Infection in Chicken

N. A. Mohymen, Sh. Mechanical
Iraq College of Medicine
Veterinary Medicine, Baghdad University

Abstract

A group of birds were passively immunized by a transfer factor extracted from lymphocytes sensitized to adenovirus and then they were challenged by the virulent virus (adenovirus isolated from hydropericardium infected birds).
The results indicatede that the groups of birds that received the transfer factor or sensitized lymphocytes were protected from having any grossly pathological changes and having a high level of anti adenovirus antibodies.

Introduction

Transfer factor (TF) is protein that transfers the ability to express cell mediated immunity from immune donors to non immune recipients (1). Many studies indicated that TF can be used in immunotherapy against many infectious diseases including viral ones. (2,3) By enhancing TH_1 secrtion pattern (4). These studies made us to suggest studying the effect of TF treatment on adenovirus infection in birds.

Materials and Methods

Virus strain: Adenovirus was isolated from infected birds (kindly given by Dr.Attar Veterinary Medicine College.Dept. of Poultry).
Vaccine: Live attenuated adenovirus (Propagated in Veterinary Medicine College Dept. of Poultry).

Birds: Thirty- five chickens, local breed, two months old were grouped in to seven groups each with five birds.

Active Immunization

One group of birds were immunized S.C. by the vaccinal strain for two successive doses after mixing with complete freund's adjuvant (containing 10_6 TCID50/0.1 ml of the virus). After two weeks from the last injection, antibody titer was determined by serum neutralization test. The results encouraged us to scarifying the birds and their spleens were taken to prepare sensitized lymphoyte and TF (TFt). Another group of birds, received phosphate buffer saline (PBS) was considered as a control group.

Sensitized lymphocytes and transfer factor prepartions: The procedure of kita etal., (5) was followed.

Passive Immunization and Challeng

Five groups of birds were kept in separate cages table (1). They were immunized with a similar procedure of the active immunization. A challenge dose of (TCID50/0.1 ml) virulent adenovirus was given i.v. route after two weeks from the second dose of transfer factor treatment.

Antisera Preparations: Blood samples were collected via heart puncture before sacrificing the birds and sera were separated from the clotted blood and kept at – 20 c until use.

Elisa: Elisa was performed to check the antibody titer according to (6), using anticken peroxidase labeled immunogobulin (kindly given by Dr.Hrith Veterinary Medicine College, Dept. of Poultry).

Results

Birds were under an observation after having the challenged dose for any clinical signs of the diseases or death for 15 days. There were no deaths among all groups. After one and two weeks when random samples of those groups were chosen and sacrificed. Post morten examination revealed grossly changes in liver and lungs taken from groups 2,4 and 5; wheras, no notable change was observed in groups 1 and 3.

Antibody titer: The results gained from ELISA indicated a high titer of anti-adenovirus antibodies in group 1 and 3. The titer reached a high degree after two weeks post challenge table (2).

Discussion

Contact with transfer factor molecules would allow naïve recipient on a first encounter with antigen to make a secondary rather than primary immunological response. Here the results showed that passive immunization with TF result in enhancement of the immune response in a matter similar to the secondary immune response manifested by the increase in titer of antibodies, so these results support that the TF can be in clinical trial as an immunomodulator in the treatment of different diseases (7,8,9). So, it is reasonable to suggest that transfer factor molecules are important for normal immunological functioning, and we suggest a further investigation to support its usefulness in such a case.

References

1. Alvarez, T. and Kirkpatrick, CH. (1996) Biotherapy 9 : 55-59.
2. Meduri, R. ;Campos, E.; Scorol , L.; Devinci, C.; Pizaa, G. and Viza, D. (1996) Bioyherapy., 9 :61-66.
3. Raise, E. ; Guerra, L. Viza, D.; Pizza, G.; Devici, C.; Schlattone, M. ; Rocaccio, L. and Grittl, F. (1996) Biotherapy, 9 : 49-54.
4. Pizza, G. ; Chlodo, F. ; Colangell, V. ; Grittle, F. ; Raise, E. ; Fudenberg, H.; Devici, C. and Visa, D. (1996) Biotherapy, 9 : 49-54.
5. Kita, E. ; Matsuda, Y.; Matsuda, K. and Koshiba, S. (1984) Cell. Immunol., 87 : 528-537.
6. Lamb, V. L. ; Jones, L. M. ; Schuring, G. G. and Berman, D.T.(1979) Infect. Immun., 26 :240-247.
7. Estrada- parra, S ; Chaves- Sanchez, R.; Ondarza-aguiliera, R.; Correa- Meza, B.; Serrano- miranda, E. and Mones- Nicolau, A. (1995) Arch. Med. Res., 26 :587-582.
8. Masi, M. ; Devinci, C. and Baricordi,O. (1996) Biotherapy, 9: 97-103.
9. Hana, I.; Vrubel, J. ; Pekarek, J. and Cech, K. (1996) Biotherapy, 9: 91-95.

Table (1) Showing the passive immunization protocol of the five groups of birds

Group number	Immunizing factors
1	TFt * + CFA
2	TFc**+ CFA
3	Sensitized lymphocyte + CFA
4	Naive lymphocyte + CFA
5	PBS + CFA

* t = test

** c = control

Table (2)Antibodies titer after passive immunization and challenged by adenovirus assisted by ELIZA.

Group number	Passive immunization with	Antibodies titer after	
		1 week	2 weeks
1	TFt	1280	>1280
2	TFc	320	>1280
3	Sensitized lymphocyte	1280	>1280
4	Naive lymphocyte	640	>1280
5	PBS	320	1280

العامل الناقل كمحفز مناعي ضد الأصابه التجريبية بفايروس الأدينو في الدجاج

نضال عبد المهيمن ، شوني ميخائيل
الكلية الطبية العراقية
جامعة بغداد، كلية الطب البيطري

الخلاصة

تم منع مجموعة من الطيور، بإعطائها العامل الناقل المستخلص من خلايا لمفاويه محسسه بفايروس الادينو وبعد ذلك أعطيت جرعه التحدي (الفايروس الضاري المعزول من طيور مصابه بـــ (hydropericardium) . أوضحت النتـــائج بـــأن مجـــاميع الطيور المستلمة للعامل الناقل أو الخلايا اللمفاويه المحسسه قد وفرت لها الحماية حيـث لم يلحظ أي تأثير نسجي عياني عند فحص عينات من أعضائها كمـــا كـــان معيـــار الأجسام المضادة المتولدة ضد فايروس الادينو عالي.