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Report of a patient with complex composites of hepatitis B virus, allergic asthma and diabetes

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PEER REVIEW

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Comments

This manuscript is a valuable and interesting report that reports of a patient with complicated conditions who has hepatitis B virus infection, allergic asthma, diabetes and other disorders. This is interesting because two main branch of cellular immune system, Th1 and Th2 have main role in this complex conditions of this patients. This could give a new viewpoint for future researches and could make new hypotheses about co-activation of two type cells (Th1 and 2) without any suppressor effect for together.
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ABSTRACT

HBV is a non-cytopathic virus and cell mediated immune response against this. Humoral mediated immune response are responsible for allergic diseases. Balance between these two subsets of Th CD4+ cells are result of the immune system response. A 56 year old woman presented with chronic HBV infection, allergic asthma, type 2 diabetes mellitus and high blood pressure and high blood lipid. Patients should be followed for the allergic and autoimmune diseases along with their viral reactivation.

KEYWORDS

HBV infection, Allergic asthma, Diabetes

1. Introduction

Hepatitis B virus (HBV) is one of the most common infectious diseases that has more prevalent in Asia-Pacific countries. HBV is a non-cytopathic virus but cell mediated immune response against the infection of HBV which is responsible for the liver injury^[1–3].

Allergic asthma is more widespread in developed countries. The increase in allergic diseases was reconciled

with the hygiene hypothesis. When hygiene is in high quality and there are low infections, allergic problems are increasing^[4].

Th1 cells mainly involve in intracellular infections and autoimmune diseases with cell mediated immune response. On the other hand, Th2 cells are responsible for extracellular infections and allergic diseases with humoral mediated immune response^[5, 6]. Balance between these two subsets of Th CD4+ cells are result of the immune system

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response. Several studies have reported a correlation between HBV reactivation and corticosteroid treatment in Asthma patients[6–8]. Therefore, when Th1 activated could stimulate Th2 and when Th2 activated could stimulate Th1 and their syndromes would be different and in separated period.

2. Report

A 56 year old woman presented with chronic HBV infection, allergic asthma, type 2 diabetes mellitus and high blood pressure and high blood lipid. The patient had a history of almost 20 years of HBV infection (healthy carrier/inactive chronic phase), recognized the age 30 years and periodic asthma and high blood pressure, starting around the age of 40 years. Now she has type 2 diabetes mellitus at the 56 year old. She was not taking a drug for HBV infection and taking Amlodipine for high blood pressure, metformin for type 2 diabetes mellitus and herbal drug for asthma. In Table 1, more data about this person were showed.

Table 1

Details data about 56 year old woman with mix diseases

Personal information	Length	170 cm
	Weight	95 Kg
	Body mass index (BMI)	33 (Obese)
	Blood pressure	Systolic 170 mmHg Diastolic 130 mmHg
Hepatic system	HBsAg	+
	HBcAg	+
	HBeAg	+
	HBV DNA	+
	ALT (SGPT)	30 IU/L
	AST (SGOT)	25 IU/L
	ALP	65 IU/L
	Total bilirubin	0.5 mg/dL
	Direct bilirubin	0.1 mg/dL
	FEV1%	65
Respiratory system	FVC%	50
	FVC/FEV1%	76
	Severity of Airway Obstruction	Moderate
	Type of Response	Mixed
Blood test	Fasting blood sugar (FBS)	390 mg/dL
	Total cholesterol	220 mg/dL
	Triglycerides	185 mg/dL
	LDL	110 mg/dL
	HDL	60 mg/dL
	T3	150 ng/dL
	T4	8.6 mcg/dL
	TSH	2.8 mIU/L
	Color, Clarity, Odor, Specific gravity, pH	Normal
	Protein and Nitrites	Negative
Urine analysis	Glucose	Positive
	Microscopic analysis (Red or white blood cells, Casts, Crystals, Bacteria, yeast cells, or parasites, Squamous cells)	Negative

3. Discussion

Allergic asthma has been defined with Th2 immune responses that are responsible for the allergic diseases in

genetically susceptible individuals. In contrast, Th1 immune responses with cytotoxic T cell lymphocyte are involved in the pathogenesis of HBV infection and liver damage diseases. Therefore when HBV infection is presented, allergic asthma should be absences. But here that is observed patient with HBV infection had allergic asthma. Some studied the cytokine profile of patients with chronic hepatitis and found expression of both Th2– and Th1–type cytokines in 50% of chronic hepatitis patients[9,10]. But Matricardi *et al*[11] studied the association of hay fever and asthma with markers of infection including HBV, and they found no association of asthma and hay fever with HBV sero–positivity. Prolonged duration of insufficient Th1 immune response, prolonged duration of Th2 immune response, increases the risk of atopy.

HBV is a non–cytopathic virus and liver damage is mainly mediated by host immune response against virus–infected liver cells[12]. Diabetes mellitus type 2 (noninsulin–dependent diabetes mellitus or NIDDM or adult–onset diabetes) is characterized by high blood glucose in the context of insulin resistance and relative insulin deficiency. This is in contrast to diabetes mellitus type 1 that there is an absolute insulin deficiency due to destruction of islet cells in the pancreas[13,14]. In this report, diabetic type is 2 and not 1, therefore it isn’t autoimmune disease and no correlation between these was observed. Therefore in this type, langerhans Islands weren’t destroyed and maybe Immune system doesn’t have role in pathophysiology of NIDDM.

Inhaled corticosteroids can also have systemic side–effects, including arterial hypertension, diabetes, obesity[15,16] but she didn’t use corticosteroids and maybe she has used very low. In Figure 1, the Pedigree shows that our patient maybe has vertical transmission from parents and she has susceptibility for allergic diseases and her infection has no effect for this. Because her HBV infection is not active and other her diseases have no correlation together. Screening for HBV reactivation and prophylactic antiviral treatment may be justified in these patients. We are suggesting that these patients should be followed for the allergic and autoimmune diseases along with their viral reactivation.

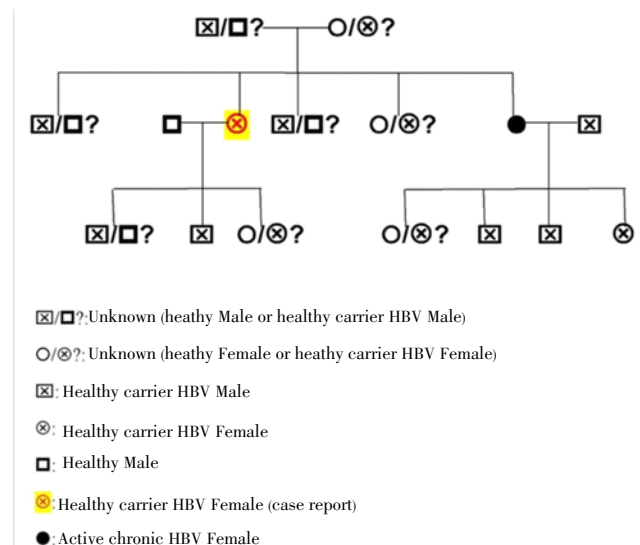


Figure 1. Family Pedigree of the mentioned patient that has HBV infection.

Conflict of interest statement

We declare that we have no conflict of interest.

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Comments

Background

HBV is a kind of infectious diseases. This virus is non-cytopathic in hepatocytes of the liver. Immune response against HBV is responsible for the liver injury. Allergic asthma is complicated problem that Th2 cells are responsible for this. Diabetic type 2 isn't autoimmune disease. This three problems reported in this manuscript.

Research frontiers

This report is in field of allergic, infection and balance of immune system. response of immune system in these is different and each type response has important role in cure or disease of these problems.

Related reports

Presence of allergic asthma, HBV infection, diabetes type 2 and other mentioned problems in one patient that is reported in this paper, in my opinion is first report.

Innovations and breakthroughs

This report is contain complex condition in one patient that she has type 1 and type 2 immune response. Therefore attention for this status in similar patients is necessary.

Applications

Patients that have asthma, HBV infection or diabetes should be followed for the allergic and autoimmune diseases along with their viral reactivation. More and deep attention for similar patients is necessary.

Peer review

This manuscript is a valuable and interesting report that reports of a patient with complicated conditions who has HBV infection, allergic asthma, diabetes and other disorders. This is interesting because two main branches of cellular immune system, Th1 and Th2 have main role in this complex conditions of this patients. This could give a new viewpoint for future researches and could make new hypotheses about co-activation of two type cells (Th1 and 2) without any suppressor effect for together.

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