Severe chronic atopic dermatitis improvement after hepatitis C virus elimination with sofosbuvir/ledipasvir treatment

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Chronic hepatitis C virus (HCV) infection is known to be associated not only with chronic hepatitis (CHC) but also with a wide range of extrahepatic manifestations (EHMs). EHMs can be divided into those of a high degree of association with HCV and those with probable or possible association. The first group includes mixed cryoglobulinemic syndrome and B-cell non-Hodgkin's lymphoma. EHMs that are probably associated with HCV include diabetes mellitus type 2 (T2DM), membrane proliferative glomerulonephritis, neurological impairment, health related quality of life (HRQoL), sicca syndrome, porphyria cutanea tarda and lichen planus while presence of autoantibodies, cardiovascular events and Mooren's corneal ulcer are possibly associated with HCV infection [1]. Some of these manifestations resolve or significantly improve after HCV elimination which was shown by multiple studies [1, 2].

In this paper we present a case study of a patient who eliminated HCV after treatment with directly acting antiviral agents (DAA), which subsequently resulted not only in marked improvement of T2DM and HRQoL but also in significant improvement of severe atopic dermatitis (AD) – a condition that up to now has not been known to be associated with HCV infection.

We present the case of a 59-year-old man who has been suffering from severe chronic atopic dermatitis since early childhood and who in the past was treated with several standard therapeutic regimens (psoralen plus ultraviolet A therapy, systemic corticosteroids, H1-blocking antihistamines, azathioprine, cyclosporine A, topical corticosteroids: fluocinolone, flumetasone, encortolon and other topical agents: clioquinol, bituminosulfonate) without any satisfactory and lasting results. Treatment with cyclosporine was complicated with acute kidney injury (AKI) and arterial hypertension (HTA). AKI resolved after cyclosporine discontinuation but HTA still requires hypotensive treatment. From the age of 7 to 25 he was treated with systemic glucocorticosteroids, which was complicated with recurrent bacterial skin infections and finally with sepsis followed by the bacterial coxarthritis that resulted in the destruction of the hip joint requiring alloplasty. In addition, since the age of 2, the patient has been suffering from severe bronchial asthma and has been hospitalized multiple times for exacerbations of the disease and asthmatic conditions. The patient also suffers from peripheral polyneuropathy, neurogenic bladder, urolithiasis of both kidneys and bladder. He also had 6 episodes of iritis of the left eye.

In 2016, the patient was diagnosed with HCV infection, genotype 1b and occult HBV infection (anti-HBc antibodies positive, HBs antigen negative, serum HBV DNA negative). Transient elastography showed moderate liver fibrosis (10.2 kPa). The same year he was diagnosed with T2DM. In 2017, he started 12-week treatment with sofosbuvir/ledipasvir (SOF/LED) for HCV infection. At the moment of anti-HCV treatment initiation the severity of AD – as assessed with the Scoring Atopic Dermatitis (SCORAD) – was 68.4 and health related quality of life (HRQoL) assessed with Sort Form 36 (SF-36) was 139. The patient was receiving the following treatment for his comorbidities: topical clobetasol and methylprednisolone 4 mg daily for AD, fluticasone and salmeterol inhalations twice daily, theophylline 250 mg once daily, fenoterol inhalation if necessary, cetirizine 5 mg once daily for asthma, premixed insulin lispro protamine suspension 50/50 8 IU twice daily and gliclazide modified release 30 mg once daily for diabetes, hydrochlorothiazide 25 mg once daily, diltiazem 120 mg once daily and valsartan 160 mg once daily for HTA, amitriptyline 25 mg twice daily for neuropathy. At the end of SOF/LED treatment (ETR) and 12 weeks after treatment

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(SVR), serum HCV RNA was negative. During and after SOF/LED treatment AD and HRQoL have been improving significantly. Nine months after SOF/LED termination, SCORAD was 18.1 (73.5% reduction) and SF-36 – 61 (56% improvement). Treatment with methylprednisolone for AD was discontinued and the patient required only minor doses of topical clobetasol. The patient has also been reporting less fatigue and significant improvement in fresh memory and spatial orientation. Due to repeated episodes of hypoglycaemia during SOF/LED treatment, the dose of insulin was reduced to 8 IU daily and gliclazide was discontinued. This treatment for T2DM was maintained after SOF/LED termination. On the other hand, there was no improvement of polyneuropathy or HTA was observed after achieving SVR.

Many skin disorders have been associated with CHC, some with better established causality than others. These disorders include purpura, porphyria cutanea tarda, lichen planus, necrolytic acral erythema, erythema multiforme, and pruritus. Less commonly reported skin manifestations include psoriasis and cutaneous form of sarcoidosis [3]. AD has not yet been observed as one of the HCV-EHMs. To date, no significant improvement in AD has been reported after elimination of HCV infection. It is difficult to explain unequivocally the possible basis of our observation, however, first of all immunological mechanisms should be taken into account. AD is a T cell-mediated inflammatory disease, mainly with an aberrant Th2-type cytokine production [4]. Th1 and Th2 cytokine response has been confirmed to be correlated with the pathogenesis of HCV infection and Th2 biased cytokine responses seem implicated in HCV pathogenesis and severity of liver disease [5] as well as may contribute to HCV-related hepatocellular carcinoma progression and pathogenesis [6]. Therefore, improved Th1/Th2 balance after HCV elimination might have also influenced AD course.

HCV is known to be associated with various neuropsychiatric disorders. This includes depression whose prevalence is higher in CHC patients than in general population [7], fatigue (prevalence 53%) [8] and cognitive impairment [9]. Mood and neurological disorders in turn negatively affect HRQoL [2]. Multiple studies have shown marked improvement of neuropsychiatric EHMs namely: depression [10], neurocognitive performance [11], as well as HRQoL [12, 13]. It has been proven that patients with HCV have worse results than controls across all scales of the SF-36. On the other hand, achieving SVR positively influences all SF-36 scales comparing to non-achieving SVR, especially in the physical health domains. HRQoL differences did not correspond with differences in liver histology or ALT levels [14]. In our patient better results in SF-36 after SVR may result not solely from HCV elimination but also from significant AD improvement.

In conclusion, to the best of our knowledge, this is the first case report of AD improvement after elimination of HCV upon DAA treatment.

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Conflict of interest

The authors declare no conflict of interest.

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