ISSN: 2469-5696

Nair et al. Int J Blood Res Disord 2020, 7:053
DOI: 10.23937/2469-5696/1410053
Volume 7 | Issue 2
Open Access

International Journal of
Blood Research and Disorders

CASE REPORT

First Report of Hemoglobin Le Lamentin [Alpha 20 (B1) His → Gln] in the Alpha1 Globin Gene in an Indian Patient and a Brief Update

Sona B Nair*, Arundhati S Athalye, Prochi F Madon and Firuza R Parikh

Department of Assisted Reproduction and Genetics, Jaslok Hospital and Research Centre, Mumbai, India

***Corresponding author:** *Sona B Nair, Department of Assisted Reproduction and Genetics, Jaslok Hospital and Research Centre, Mumbai, India, Tel: 022-6657-3343*

Abstract

Alpha globin gene structural variants are caused mainly due to point mutations in the alpha globin gene. They are generally asymptomatic but in rare cases cause problems in association with other structural variants of thalassemia. We report here for the first time in Indian population a rare alpha globin gene structural variant named Hb Le Lamentin.

Our main aim of presenting this case is to create awareness that this variant may be commonly present in the Indian population also though the previous cases have been reported outside Indian population. Therefore extreme precaution needs to be taken during routine screening and investigations as to avoid any misdiagnosis or misinterpretation due to the interference of this variant. Since this is the first case from India it needs to be seen if it always behaves normal in Indian population or causes problems in combination with other disorders or variants as reported in previously published cases.

Keywords

Alpha globin gene, Structural variant, Hb Le Lamentin

Introduction

Hemoglobinopathies are characterized by either reduced or absent synthesis of alpha or beta globin chains (thalassemia) or by abnormal globin chain variant which may affect the function of the hemoglobin molecule [1]. These hemoglobin variants are identified based on their retention times (RT) on Ion-Exchange high-performance liquid chromatography (HPLC) with the help of hemoglobin variant library [2]. Most of the hemoglobin variants are completely asymptomatic even in combination with other variants and they are detected only during routine investigations or screening. However, some of these variants interfere with the screening and diagnosis of other disorders or variants. Le Lamentin is one such alpha globin gene structural variant which does not cause any clinical problems or affect the hematological parameters in the patient. They are completely asymptomatic even when associated with a β-thalassemia trait [3] or in homozygous condition or as double heterozygous with another alpha chain variant [4].

There have been reports showing that the presence of this variant interferes with the elution time of HbA1c resulting in reduced and erroneous levels. This is very risky as HbA1c is considered as one of the most reliable marker for monitoring the patients with diabetes mellitus. The wrong levels of HbA1c in patients with diabetes will cause problems in their treatment which can in turn lead to serious consequences [4,5]. Therefore one has to be extremely careful when interpreting the results of HPLC for HbA1c or for beta thalassemia trait to check for any unknown peaks in the P3 window to rule out any possible chances of misdiagnosis or misinterpretation. Till date there has been no report of any case of Hb Le Lamentin from India.

We report here a first case of Hb Le Lamentin an Indian patient. The main aim of reporting this case is to create awareness that this variant may be commonly present in the Indian population too.

Material and Methods

A 26-year-old male from Kashmir, was referred to us for routine investigation and screening prior to the IVF treatment. An informed consent was obtained from the patient prior to testing. Complete blood count was done on an automated cell counter (Sysmex K-1000;

Citation: Nair SB, Athalye AS, Madon PF, Parikh FR (2020) First Report of Hemoglobin Le Lamentin [Alpha 20 (B1) His → Gln] in the Alpha1 Globin Gene in an Indian Patient and a Brief Update. Int J Blood Res Disord 7:053. doi.org/10.23937/2469-5696/1410053

Accepted: July 11, 2020: **Published:** July 13, 2020

Sysmex Corporation, Kobe, Japan). Hemoglobin analysis was done using cation exchange high performance liquid chromatography (HPLC) on the VARIANT Hemoglobin Testing system (Bio-Rad Laboratories, Hercules, California, U.S.A.) using the β thal short programme. DNA extraction was done from the EDTA blood sample of the patient using Qiagen blood DNA extraction kit as per the manufacturer's protocol. Screening for 8 common alpha thalassemia deletions was done using multiplex PCR. The entire alpha globin gene was amplified and directly sequenced to detect the alpha globin gene variants using ABI 310 automated DNA sequencer using the BigDye terminator kit (Applied Biosystems, Foster city, California, USA).

Result and Discussion

The patient did not have any major clinical symptoms. The results of hematological indices in the patient were completely normal. The chromatogram of the hemoglobin electrophoresis done on HPLC showed an abnormal peak of 23.3% in the P3 window with the RT of 1.59 minutes. Alpha globin gene deletions were found to be absent. Complete alpha globin gene sequencing showed a histidine to glutamine substitution at codon 20C -> A in heterozygous state (Hb Le Lamentin trait) in the alpha1 globin gene. His HbA1c level was 4.2% and estimated average glucose was 73.84 mg/dl. He was a non-diabetic.

Since the histidine to glutamine substitution at codon 20 in Hb Le Lamentin is reported to be present in an external residue of the hemoglobin molecule, it is not known to cause any change in the physiological function of the hemoglobin. This variant has been previously reported in a black family in French West Indies (Martinique) [6], and Spanish [3], Japanese [7] and British families [5,8]. This is the first report of this rare variant in Indian population. The cases of Hb Le Lamentin reported earlier also were asymptomatic and they were identified during routine screening for diabetes [5,8], beta thalassemia [3] or cord blood screening [6]. Our patient similar to the earlier reports did not have any major clinical symptoms. There have been no reports of any clinical consequences when Hb Le Lamentin is inherited in homozygous state, heterozygous state or in association with any other variants of hemoglobin or thalassemia as reported previously. But one has to be extremely careful during routine screening and interpretation of the patient's report especially in diabetics as this variant has been reported to interfere in the HbA1c levels during routine screening which may lead to wrong results and which may prove detrimental to patient's treatment. Since there are approximately 813 alpha globin gene variants reported till date in the globin gene server extreme precaution needs to be taken so as not to overlook or misinterpret the alpha globin gene variants while screening. Hb Le Lamentin may prove to be of clinical significance in association Lamentin may with other mutations or variants which have not been reported in association with Le Lamentin so far.

Conflict of Interest

The authors declare no conflict of interest.

References

1. DJ Weatherall (2010) The inherited disorders of hemoglobin are an emerging global health burden. Blood 115: 4331-4336.
2. A Joutovsky, J Hadzi-Nesic, MA Nardi (2004) HPLC retention time as a diagnostic tool for hemoglobin variants and hemoglobinopathies: a study of 60000 samples in a clinical diagnostic laboratory. Clin Chem 50: 1736-1747.
3. JJ Malcorra-Azpiazu, MI Balda-Aguirre, JC Diaz-Chico, F Kutlar, A Kutlar, et al. (1988) Hb Le Lamentin or alpha 2 20(B1)His----GLN beta 2 found in a Spanish family. Hemoglobin 12: 201-205.
4. R Martinez-Lopez, F de la Feunte-Gonzalo, JM Nieto, CB Gallar, CR Roman, et al. (2016) Different forms of Le Lamentin. An unexpected finding in Hb A1c quantification. Clin Biochem 49: 57-60.
5. K Weiner, X McFarlane, BN Green (2001) Increasing recognition of haemoglobin Le Lamentin. J Clin Pathol 54: 970.
6. M Sellaye, Y Blouquit, F Galacteros, N Arous, N Monplaisir, et al. (1982) A new silent silent hemoglobin variant in a black family from French West Indies, hemoglobin Le Lamentin alpha 20 His replaced by Gln. FEBS Lett 145: 128-130.
7. T Harano, K Harano, S Shibata, S Ueda, K Imai, et al. (1983) Hb Le Lamentin [alpha 20 (B 1) His----Gln] in Japan: structure, function and biosynthesis. Hemoglobin 7: 181-184.
8. TM Reynolds, F McMillan, A Smith, A Hutchinson, B Green (1998) Haemoglobin Le Lamentin (alpha 20 (B1) His-->Gln) in a British family: identification by electrospray mass spectrometry. J Clin Pathol 51: 467-470.