Essential Thrombocythemia (ET) is a myeloproliferative disorder with elevated number of thrombocytes and Facioscapulohumeral Muscular Dystrophy (FSHD) is the third most common dystrophy among all dystrophies. In this paper, we report a novel coincident FSHD case with ET.

The male FSHD case was diagnosed at the age of 17 with difficulty of elevating his arms. He had 4q35 D4Z4 repeat contraction. Neurological examination: Facial involvement (+) and scapula alatae (+); right and left shoulder flexion 4+; right forearm flexion 4+, left forearm flexion 3+; right and left hip flexion 4+; remaining muscle strengths were 5+. There were mild involvement and loss of power in the extensor indicis, peroneal muscles and abdominal muscles. When case was 67-year-old, he admitted to the hematology clinic with facial redness and increased platelet count (1,200,000/mm³) without hepatosplenomegaly.

Since myeloproliferative neoplasms (MPN) frequently related with the somatic mutations of JAK2, MPL and CALR genes, the patient’s blood sample was analyzed for the hot-spot mutations of these genes. The exon 10 region of MPL gene was analyzed for p.W515K/L mutation and the exon 9 region of CALR gene was analyzed for insertion/deletion mutations with PCR/sequencing methods. The exon 14 region of JAK2 (Janus kinase 2) gene was investigated for p.V617F (c.1849G>T) mutation with quantitative real time PCR method.
The quantitation of JAK2 p.V617F mutation was performed by using plasmids of wild type and mutant alleles. There was no mutation in the target regions of MPL and CALR genes. In the exon 14 region of JAK2 gene p.V617F (c.1849G> T) mutation was detected with 28% allele burden. (Figure 1) His child had also been investigated for JAK2 p.V617F (c.1849G> T) mutation and found negative. Finally, he was diagnosed high risk ET because of his age >60 years with JAK2 mutation, hydroxyurea and low dose aspirin were started. The presence of JAK2 p.V617F mutation confirmed the diagnosis of ET. There has been no report on the coincidence of FSHD with MPN including ET and JAK2 p.V617F mutation, and this is the first case in the literature. Recently, a number of reports indicated that some of the germ-line DNA variants may predispose to MPN with JAK2 p.V617F mutation [1]. FSHD patients are prone to develop other systemic diseases especially malignancies [2] via re-expression of DUX4 gene that allows cancer cell to escape immune surveillance [3]. In addition, myeloid cells (including thrombocytes) and skeletal muscle cells originate from mesoderm. It has been shown that JAK/STAT pathway is responsible for proliferation and differentiation of both myeloblast and myoblast cells [4,5]. Our case might indicate a common mechanism responsible for the development of FSHD and MPN. In addition to the effect of DUX4, since JAK signaling has important functions in the development of both skeletal muscle and thrombocytes, we propose that this co-indication is precious to focus on the role of JAK/STAT pathway for FSHD pathophysiology which can also contribute ET molecular mechanisms.

Conflicts of Interest
The authors declare no conflict of interest. All procedures performed in this study were in accordance with the ethical standards of Akdeniz University Institutional Ethical Committee (Decision Number: 284, Date: 28.10.2015) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This study was funded by Akdeniz University Research Foundation.

Contributor’s Statement: CH and SBK designed the study; AT, OKY, HU, CH, SBK acquired the data; AT analyzed the samples; CH, SBK, AT, OKY, HU interpreted the findings and wrote the paper.

Keywords: Essential Thrombocythemia, ET, Facioscapulohumeral Muscular Dystrophy, FSHD, JAK2 p.V617F mutation

References

**Figure 1.** Visual representation of q-PCR results of JAK2 gene in the patient.