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| **Supplementary Table S2. Clinical findings of the Iranian AD-HSP families harboring the mutations** | | | |
| **in *KIF5A,* *ATL1,* and *MFN2* genes** | |  |  |
| **Family ID** | **HSP120** | **HSP123** | **HSP133** |
| **Genetic data** |  |  |  |
| Gene | *KIF5A* | *ATL1* | *MFN2* |
| Variant | c.A758T:p.Lys253Met | c.C715T:p.Arg239Cys | c.G380A:p.Gly127Asp |
| ACMG criteria | Likely pathogenic | Pathogenic | Likely pathogenic |
| Exon | NM\_004984:exon9 | NM\_001127713:exon8 | NM\_014874:exon5 |
| Zygosity | Het | Het (*de novo*)\* | Het |
| Familial/Sporadic | Familial | Sporadic | Familial |
| **Clinical data** |  |  |  |
| Gender/Individual ID | M | F | F |
| Consanguinity |  | + | - |
| Type of disease | SPG10 (Complicated) | SPG3A (Pure) | HSP+Neuropathy (Complicated) |
| Present age (yrs) | 23 | 7 | 28 |
| Age at onset (yrs) | 10 | 1.5 | 14 |
| LL spasticity | + | + | + |
| LL weakness | + | + | Distal |
| UL spasticity and weakness | - | - | - |
| Babinski sign | + | + | + |
| Deep tendon reflexes | + | + | Increased |
| Motor Deficit | Spastic gait | Spastic gait | + |
| Pes cavus | - | - | + |
| Intellectual disability | - | - | - |
| Epilepsy | - | - | - |
| Hearing impairment | - | - | - |
| Vibration impairment | + | + | + |
| Urinary dysfunction | - | - | - |
| Dysphagia | - | - | - |
| Dysarthria | - | - | - |
| Neuropathy | + | - | + |
| Optic atrophy | - | - | - |
| Het: Heterozygous, M: male, F: female, -: negative, +: positive, LL: lower limbs, UL: upper limbs  \* At first, we thought the pattern of inheritance may be AD with incomplete penetrance and this family was included to the study. After genetic analysis, a *de novo* heterozygous mutation in *ATL1* was detected. Regarding to this proband carried a heterozygous variant; we decided to report her with other AD-HSP families. | | |  |