

**Supplementary Table 1.** The clinical characteristics of WD patients with CDM previously reported

| Reference                                  | Patient no. | Sex/age at CDM onset | Age at WD onset | Country     | Anti-copper therapies   | Clinical symptoms  |                                    | Cu metabolism                               | Zn metabolism                                  | Neuroimaging  | CDM Treatment  | Outcome  |
|--|-------------|----------------------|-----------------|-------------|---|--|------------------------------------|---|--|---|--|--|
|  |             |                      |                 |             |   | Neurological   | Hematologic                        |   |  |   |  |  |
| Narayan and Kaveer (2006) <sup>1</sup>     | 1           | M/13 y               | 9 y             | India       | PCA 750 mg/d + ZS 280 mg/d  | Difficulty in using hands and ambulating, decreased deep sensation of LL | Anemia                             | Serum Cu 16 µg/dL                           | Serum Zn 155 µg/dL                             | White matter tracts demyelination in brain CT             | N/A  | N/A  |
| Foubert-Samier et al. (2009) <sup>2</sup>  | 2           | M/43 y               | 15 y            | France      | TH 900 mg/d + ZA 400 mg/d   | Length-dependent sensory-motor axonal neuropathy                         | Anaemia and neutropenia            | Serum Cu 0.5 µmol/L, urinary Cu 1.7 µmol/d  | Serum Zn 38.5 µmol/L                           | Brain and spinal MRI were normal                          | ZA withdraw, reduced TH to 300 mg/d                  | Hematologic symptoms recovered, neuropathy improved            |
| Horvath et al. (2010) <sup>3</sup>         | 3           | M/40 y               | 25 y            | Switzerland | PCA initialed, then switched to ZS 880 mg/d, and up to 1,100 mg/d     | Length-dependent sensory-motor axonal neuropathy                         | Anaemia and neutropenia            | Serum Cu 0.5 µmol/L, urinary Cu 0.54 µmol/d | Serum Zn 48.6 µmol/L, urinary Zn >207.4 µmol/d | Spinal MRI was normal                                     | ZS withdraw  | Hematologic symptoms recovered, neuropathy persists            |
| Cortese et al. (2011) <sup>4</sup>         | 4           | F/51 y               | 19 y            | Italy       | ZS 600 mg/d, up to 1200 mg/d  | Sensory-motor peripheral neuropathy                                      | Macrocytic anaemia and neutropenia | Serum Cu 5 µg/dL, urinary Cu 20 µg/d        | N/A  | Spinal MRI were normal                                    | Reduced ZS to 600 mg/d, then switched to ZA 150 mg/d | Hematologic symptoms recovered, neuropathy persists            |
| da Silva-Júnior et al. (2011) <sup>5</sup> | 5           | F/44 y               | 29 y            | Brazil      | PCA initialed, then switched to ZA 450 mg/d                           | Sensory axonal polyneuropathy and myelopathy                             | Leukopenia and thrombocytopenia    | Serum Cu 3 µg/dL, urinary Cu 7.4 µg/d       | Serum Zn 311 µg/dL                             | Abnormal in posterior column from C1 to C6                | ZA withdraw  | Sensory symptoms improved, MRI findings was remained           |
| Lozano Herrero et al. (2012) <sup>6</sup>  | 6           | F/56 y               | 18 y            | Spain       | Low-copper diet, PCA 750 mg/d initialed, then switched to ZA 503 mg/d | Sensory and spastic ataxic gait  | N/A                                | Serum Cu 3 µg/dL, urinary Cu undetectable   | Serum Zn 179 µg/dL, urinary Zn > 225 µg/d      | Abnormal in posterior column from C2 to C7                | ZA withdraw, Cu supplement                           | Improved   |
| Teodoro et al. (2013) <sup>7</sup>         | 7           | M/36 y               | 20 y            | Portugal    | TH 500 mg/d + ZS 330 mg/d   | Sensory-motor peripheral neuropathy and myelopathy                       | Anemia                             | Serum Cu 13.3 µg/dL, urinary Cu 40.5 µg/d   | Serum Zn 14.71 µmol/L                          | MRI showed abnormal in posterior column                   | Stopped TH and ZS                                    | Gait recoverd, mild reduction of spinal cord lesions           |
| Dzieżyc et al. (2014) <sup>8</sup>         | 8           | F/37 y               | 21 y            | Poland      | ZS (as Zinc element 180 mg/d)   | Paraesthesias in the fingers and toes, weakness of LL                    | Leucopenia                         | Serum Cu 5 µg/dL, urinary Cu 11 µg/d        | Serum Zn 474 µg/dL                             | Abnormal in posterior column from C7-T1                   | ZS withdraw  | Posterior column dysfunction improved, and lesion was shrinked |
| Ghaffar et al. (2016) <sup>9</sup>         | 9           | F/40 y               | 35 y            | Egypt       | PCA initialed, then switched to ZS 225 mg/d                           | Tingling and numbness of LL  | Anemia and leukopenia              | Serum Cu 18 µg/dL, urinary Cu 73 µg/d       | N/A  | N/A   | Decreased ZS to 100 mg/d                             | Recoverd   |
|  | 10          | F/14.5 y             | 13.5 y          | Egypt       | PCA 1,500 mg/d + ZS 150 mg/d  | Weakness of LL and ataxic gait   | N/A                                | Serum Cu 20 µg/dL, urinary Cu 69.6 µg/d     | N/A  | N/A   | Decreased PCA to 500 mg/d                            | Improved   |
| Cai et al. (2019) <sup>10</sup>            | 11          | F/12 y               | 6 y             | China       | Low-copper diet, ZnG 350 mg/d, increased to 560 mg/d                  | Abnormal gait  | Normocytic anemia and neutropenia  | Serum Cu 56.3 µg/dL, urinary Cu 30 µg/d     | Serum Zn 500 µg/dL                             | N/A   | ZnG withdraw   | Recoverd   |
| Wu et al. (2020) <sup>11</sup>             | 12          | F/18 y               | 17 y            | Iraq        | PCA + TH, then switched to zinc therapy 150 mg/d, up to 225 mg/d      | Axonal sensory neuropathy and myelopathy                                 | N/A                                | Urinary Cu significantly reduced            | N/A  | Abnormal in posterior column in the upper thoracic region | Cu supplement 10 mg/d                                | Recoverd   |
| Ueda et al. (2023) <sup>12</sup>           | 13          | F/57 y               | 20 y            | Japan       | Zn 80 mg/d + PCA 1,000 mg/d, increased Zn to 150 mg/d                 | Sensory-motor axonal polyneuropathy and myelopathy                       | Macrocytic anemia                  | Serum Cu 11 µg/dL, urinary Cu 74 µg/d       | Serum Zn 127 µg/dL                             | Abnormal in posterior column form C1-C6                   | Stopped Zinc and PCA, Cu supplement 1.67 mg/d        | Hematologic symptoms recovered, myeloneuropathy improved       |
| Chevalier et al. (2023) <sup>13</sup>      | 14          | M/78 y               | 58 y            | France      | PCA 900 mg/d, then switched to ZA 150 mg/d                            | Axonal sensory neuropathy of LL  | Anemia and neutropenia             | Serum Cu 0.34µmol/L, urinary Cu 0.34µmol/L  | Serum Zn 29.1 µmol/L, urinary Zn 98 µmol/L     | Spinal and brian MRI were normal                          | Zn withdraw  | Hematologic symptoms recovered, neuropathy improved            |
|  | 15          | M/57 y               | 23 y            | France      | PCA 900 mg/d, then switched to TH 600 mg/d + ZS 1,200 mg/d            | Axonal sensory-motor polyneuropathy of LL                                | Pancytopenia                       | Serum Cu 0.48 µmol/L, urinary Cu 0.1 µmol/L | Serum Zn 23.7 µmol/L, urinary Zn 53.7 µmol/L   | Spinal and brian MRI were normal                          | TH withdraw, ZS decreased to 200 mg/d                | Hematologic symptoms recovered, neuropathy improved            |

WD, Wilson's disease; CDM, copper deficiency myeloneuropathy; Cu, copper; Zn, zinc; M, male; F, female; PCA, Penicillamine; TH, TH hydrochloride; ZS, zinc sulphate; ZA, zinc acetate; LL, lower limbs; ZnG, zinc gluconate; CT, computed tomography; MRI, magnetic resonance imaging; N/A, Not applicable.

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