

**Table 1.** Demographic characteristics and clinical indices.

| Measure               | Control group (n=20) |     | TMD group (n=20) |     | t-test |
|-----------------------|----------------------|-----|------------------|-----|--------|
|                       | Mean                 | SD  | Mean             | SD  | P      |
| Age [year]            | 26.3                 | 3.1 | 27.8             | 4.5 | NS     |
| OMES [score]          | 95                   | 5   | 82               | 4   | 0.000  |
| Pain duration [month] | --                   | --  | 46               | 42  | --     |
| Pain side [n]         | DDR side [n]         |     |                  |     |        |
| bilateral             | bilateral            |     | 7 (35%)          |     |        |
| bilateral             | unilateral           |     | 10 (50%)         |     |        |
| unilateral            | bilateral            |     | 1 (5%)           |     |        |
| unilateral            | unilateral           |     | 2 (10%)          |     |        |

NS, non-significant inter-group difference ( $P>0.05$ ). Pain stands for myalgia and/or arthralgia.

**Table 1.** Opening/closing parameters. Descriptive statistics and post-hoc t-tests following significant MANOVA.

| Measure                                   | unit   | Control group |        | TMD group |        | t-test |
|---|--------|---------------|--------|-----------|--------|--------|
|   |        | (n=20)        | (n=20) | (n=20)    | (n=20) | P      |
| IP 3D displacement at MMO                 | [mm]   | 48.4          | 4.0    | 44.3      | 8.3    | NS     |
| IP lateral displacement at MMO (abs.)     | [mm]   | 1.3           | 0.9    | 1.5       | 1.2    | NS     |
| IP peak-to-peak lateral deviation         | [mm]   | 2.8           | 0.8    | 4.2       | 1.7    | 0.002  |
| Mandibular sagittal angle at MMO          | [°]    | 34.0          | 4.2    | 30.5      | 6.7    | NS     |
| Mandibular frontal angle at MMO (abs.)    | [°]    | 2.9           | 2.6    | 2.7       | 1.6    | NS     |
| Mandibular horizontal angle at MMO (abs.) | [°]    | 2.6           | 1.8    | 2.1       | 1.7    | NS     |
| Mean CRP downward displacement at MMO     | [mm]   | 6.9           | 2.5    | 5.2       | 3.1    | NS     |
| SI of CRP vertical displacement at MMO    | [%]    | 76            | 16     | 59        | 45     | NS     |
| Mean CRP forward displacement at MMO      | [mm]   | 12.7          | 3.4    | 11.3      | 4.3    | NS     |
| SI of CRP sagittal displacement at MMO    | [%]    | 84            | 14     | 75        | 24     | NS     |
| Mean IP opening velocity                  | [mm/s] | 73.1          | 23.6   | 59.3      | 20.4   | NS     |
| Mean IP closing velocity                  | [mm/s] | 71.9          | 18.9   | 54.1      | 15.9   | 0.003  |
| Mean CRP opening velocity                 | [mm/s] | 24.8          | 7.5    | 20.0      | 7.3    | NS     |

|                                    |        |      |     |      |     |        |
|------------------------------------|--------|------|-----|------|-----|--------|
| Mean CRP closing velocity          | [mm/s] | 24.5 | 6.4 | 18.0 | 7.8 | 0.006  |
| FI <sub>OC</sub>                   | [%]    | 94   | 8   | 82   | 16  | 0.002* |
| Mean CRP opening translation       | [mm]   | 16.5 | 3.0 | 15.1 | 3.8 | NS     |
| Mean CRP closing translation       | [mm]   | 16.2 | 2.8 | 15.1 | 3.9 | NS     |
| SI of CRP opening translation      | [%]    | 87   | 11  | 83   | 11  | NS     |
| SI of CRP closing translation      | [%]    | 87   | 10  | 83   | 13  | NS     |
| Mean CRP opening translation index | [%]    | 24   | 4   | 24   | 3   | NS     |
| Mean CRP closing translation index | [%]    | 24   | 3   | 24   | 5   | NS     |
| Mean CRP opening inconstancy index | [%]    | 9    | 4   | 11   | 5   | NS     |
| Mean CRP closing inconstancy index | [%]    | 11   | 4   | 13   | 5   | NS     |
| CRP opening asynchrony index       | [%]    | 5    | 2   | 9    | 4   | 0.004  |
| CRP closing asynchrony index       | [%]    | 5    | 2   | 10   | 6   | 0.000* |
| FI <sub>T</sub>                    | [%]    | 93   | 7   | 79   | 15  | 0.001  |

MANOVA, P=0.012

\* = Mann-Whitney U-test was used for non-normal data distributions.

NS, non-significant inter-group difference after Benjamini-Hochberg correction (P>0.010); abs., absolute value.

MMO, maximum mouth opening; IP, interincisal point; CRP, condylar reference point; SI, symmetry index;

FI<sub>OC</sub>, functional index of mouth opening/closing.

CRP, condylar reference point; FI<sub>T</sub>, functional index of CRP translation during mouth opening/closing.

**Table 3.** Bilateral laterotrusions and protrusion parameters. Descriptive statistics and post-hoc t-tests following significant MANOVA.

| Measure                                 | Unit | Control group |        | TMD group |        | t-test<br>P |
|---|------|---------------|--------|-----------|--------|-------------|
|   |      | (n=20)        |        | (n=19)    |        |             |
| Mean IP lateral displacement at MML     | [mm] | Mean 9.7      | SD 1.9 | Mean 8.3  | SD 1.9 | NS          |
| SI of IP lateral displacement at MML    | [%]  | 93            | 6      | 80        | 12     | 0.000*      |
| Mean bCRP downward displacement at MML  | [mm] | 6.3           | 1.6    | 5.3       | 1.6    | NS          |
| SI of bCRP vertical displacement at MML | [%]  | 83            | 12     | 71        | 17     | NS          |

|   |      |     |     |     |     |        |
|---|------|-----|-----|-----|-----|--------|
| Mean bCRP forward displacement at MML   | [mm] | 8.3 | 2.4 | 7.0 | 2.7 | NS     |
| SI of bCRP sagittal displacement at MML | [%]  | 88  | 8   | 75  | 19  | 0.012  |
| Mean bCRP medial displacement at MML    | [mm] | 1.6 | 0.7 | 1.6 | 0.9 | NS     |
| IP forward displacement at MMP          | [mm] | 7.7 | 1.5 | 7.0 | 2.1 | █      |
| IP lateral displacement at MMP (abs.)   | [mm] | 0.8 | 0.7 | 0.9 | 0.7 | █      |
| Mean CRP downward displacement at MMP   | [mm] | 4.9 | 1.4 | 3.9 | 2.3 | █      |
| SI of CRP vertical displacement at MMP  | [%]  | 87  | 10  | 83  | 14  | █      |
| Mean CRP forward displacement at MMP    | [mm] | 7.1 | 1.6 | 6.7 | 2.1 | █      |
| SI of CRP sagittal displacement at MMP  | [%]  | 85  | 9   | 80  | 15  | █      |
| FI <sub>LP</sub>                        | [%]  | 94  | 11  | 77  | 20  | 0.000* |

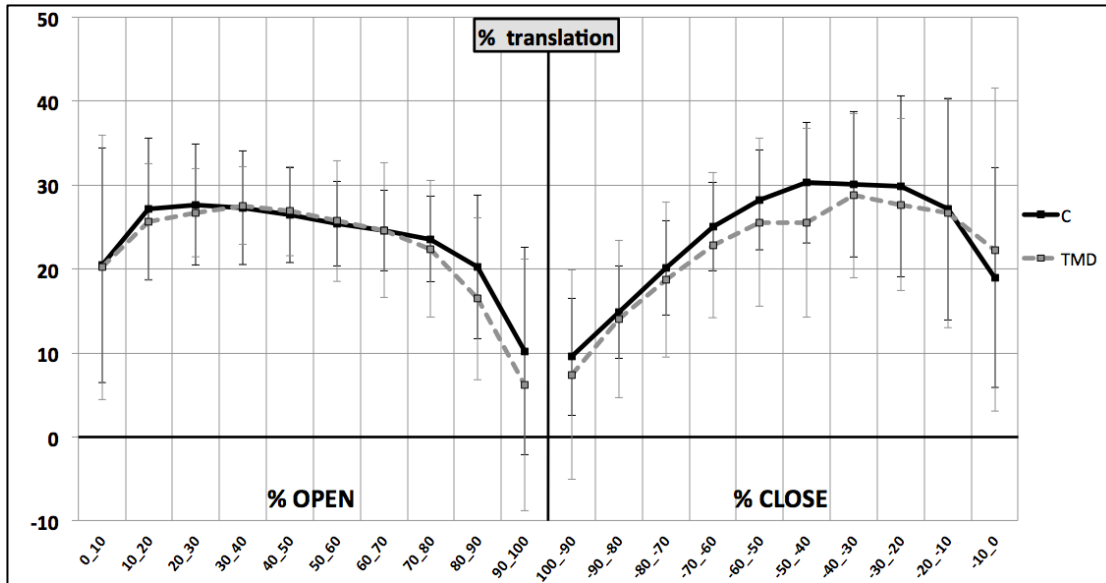
Bilateral laterotrusions' parameters: MANOVA, P=0.017; protrusion's parameters: MANOVA, P>0.05

\* = Mann-Whitney U-test was used for non-normal data distributions.

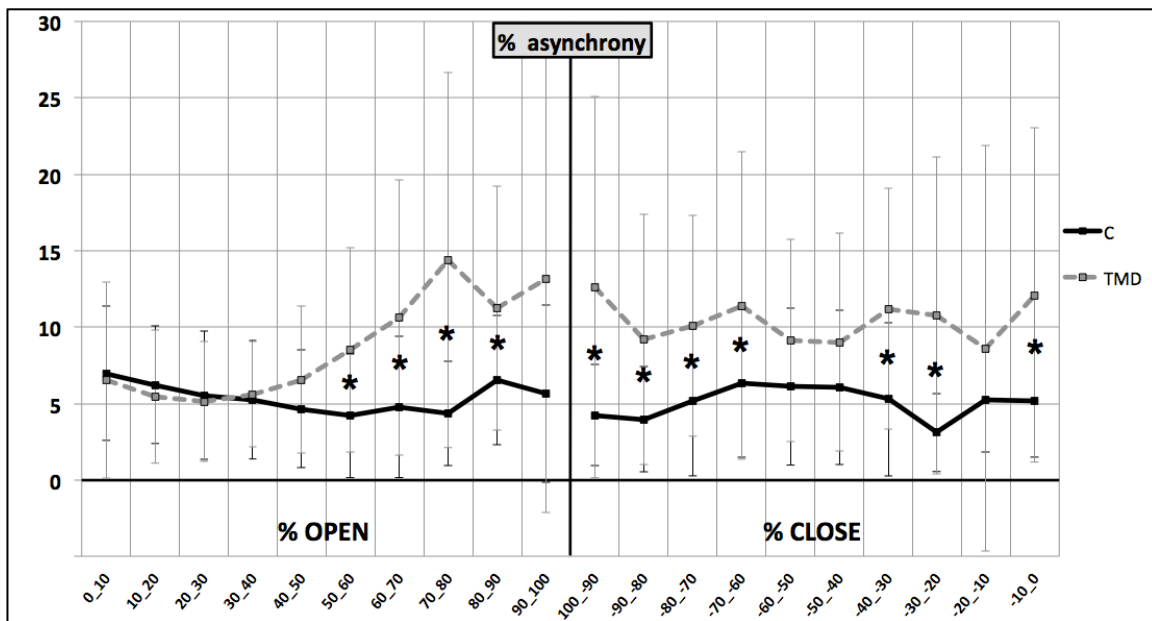
NS, non-significant inter-group difference after Benjamini-Hochberg correction (P>0.014); abs., absolute value.

One TMD subject did not performed these tasks.

MML, maximum mandible laterotrusion; MMP, maximum mandible protrusion; IP, interincisal point; bCRP, balancing condylar reference point; SI, symmetry index; FI<sub>LP</sub>, functional index of mandible laterotrusions and protrusion.



**Figure 1.** Mean and SD of CRP translation indices for each 10%-step of MMO during mouth opening and closing. C, control group; TMD, pathologic group. No significant inter-group differences in any step.



**Figure 2.** Mean and SD of CRP asynchrony indices for each 10%-step of MMO during mouth opening and closing. C, control group; TMD, pathologic group. \* = Significant inter-group difference (Mann-Whitney U-test).