Performance in handball depends upon a variety of individual skills and the interaction among different players within the team. Although handball is an intermittent sport that primarily utilizes aerobic metabolism, the anaerobic capabilities are considered important as they represent particularly critical moments. The aim of this study was to quantify possible differences in anthropometrical indices, throwing velocity, sprinting, vertical jump, endurance running, absolute and relative strength by playing position and competitive level in male elite handball.

In total, 176 male Norwegian national team and 1st division players (age 23 ± 4 year, body mass 89 ± 11 kg, body height 188 ± 5 cm) were tested. They performed a broad range of physical, handball-related tests in the following order: 1) throwing velocity, 2) 20-m sprint, 3) countermovement jump (CMJ), 4) 3000-m running, 5) squats and 6) bench press. All tests were performed on the same day for each player as part of a national centralized physical testing scheme.

National team back players achieved higher throwing velocities than 1st division back players in set shots (9.4%, p<0.01, d=1.5) and jump shots (7.9%, p<0.01, d=1.5). Wings achieved better 0-20-m sprint times (panel A) than pivots (3.5%, p=0.01, d=1.2) and goalkeepers (5.4%, p>0.01, d=1.2). National team back players exhibited better 3000-m performance than 1st division back players (5.0%, p=0.011, d=0.7).

No significant differences were observed for 1RM squat across positions (panel A) or playing standard. Back players had better relative strength in squat (Panel B) than pivots (12.1%, p=0.016, d=0.7). Wings had better relative strength in squat that pivots (17.4%, p=0.001, d=1.0) and goalkeepers (13.1%, p=0.016, d=0.8).

No significant differences in 1RM or relative strength for bench press across playing standard were observed. Pivots were 8.9% stronger than wing players (p=0.044, d=0.7) in 1RM bench press (panel C). Wings had better relative strength in bench press (Panel D) than back players (8.3%, p=0.007, d=0.6), pivots (14.1%, p<0.001, d=1.0) and goalkeepers (15.3%, p<0.001, d=1.1).

Our results clearly demonstrate that throwing velocity is crucial for back players of national team standard. Ten of the eleven best individual set shot values (28.5–30.5 m s⁻¹) and eight of the twelve best jump shot values (26.4–28.3 m s⁻¹) were achieved by national team back players. 3000-m running performance seem to distinguish national team back players from 1st division back players. Moreover, relative strength seems to be fundamentally more important than absolute strength. Handball athletes have lots of qualities to develop, and coaches should take physical fitness into account within the larger skill set of team handball.