**Table 1** Correlation coefficients between T concentration and athletics

performance in 21 female events

|  |  |  |  |
| --- | --- | --- | --- |
| Event | n | Spearman rho | p value |
| **100 m** | 96 | 0.092 | 0.37 |
| **100 m H** | 59 | 0.109 | 0.41 |
| **200 m** | 59 | 0.009 | 0.94 |
| **400 m** | 62 | -0.239 | 0.06 |
| **400 m H** | 52 | -0.310 | 0.03 |
| **800 m** | 56 | -0.348 | 0.009 |
| **1500 m** | 55 | -0.197 | 0.15 |
| **3000 m SC** | 49 | 0.028 | 0.85 |
| **5000 m** | 36 | -0.098 | 0.57 |
| **10 000 m** | 29 | 0.024 | 0.90 |
| **Marathon** | 86 | 0.056 | 0.70 |
| **Discus** | 36 | 0.176 | 0.15 |
| **Hammer Throw** | 42 | 0.373 | 0.015 |
| **Shot Put** | 42 | 0.228 | 0.15 |
| **Javelin** | 42 | -0.070 | 0.66 |
| **Long Jump** | 50 | -0.064 | 0.66 |
| **Triple Jump** | 41 | 0.020 | 0.90 |
| **High Jump** | 44 | -0.135 | 0.38 |
| **Pole Vault** | 39 | 0.219 | 0.18 |
| **20 km RW** | 80 | -0.135 | 0.23 |
| **Heptathlon** | 47 | 0.033 | 0.83 |

n is the number of female athletes in each event.

**Table 2** Results for non-parametric comparison between the lowest and highest T tertiles with regard to athletic performances in female running events

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Event | n | Lowest T Tertile | Highest T Tertile | Mann-Withney W (p) values |
| **100 m** |  |  |  |  |
| Time s T nmol/L | 32 | 11.44 (10.93-14.69)  0.47 (0.21-0.64) | 12.06 (10.99-13.95)  1.22 (0.92-2.33) | 631 (0.11) |
| **100 m H** |  |  |  |  |
| Time s T nmol/L | 20 | 13.02 (12.44-14.38)  0.49 (0.01-0.59) | 13.21 (12.47-14.62)  1.05 (0.84-1.94) | 254 (0.15) |
| **200 m** |  |  |  |  |
| Time s T nmol/L | 20 | 23.25 (22.37-24.47)  0.44 (0.27-0.53) | 23.17 (22.22-26.34)  1.09 (0.88-3.41) | 199 (0.99) |
| **400 m** |  |  |  |  |
| Time s T nmol/L | 21 | 52.10 (49.86-54.10)  0.41 (0.08-0.54) | 51.02 (49.41-53.26)  1.43 (0.86-43.61) | 132 (0.03) |
| **400 m H** |  |  |  |  |
| Time s T nmol/L | 17 | 56.66 (55.05-71.49)  0.46 (0.07-0.61) | 55.02 (52.47-59.05)  1.25 (0.91-7.59) | 90 (0.06) |
| **800 m** |  |  |  |  |
| Time s T nmol/L | 19 | 122.0 (118.7-134.3)  0.42 (0.14-0.53) | 119.4 (115.9-122.9)  1.11 (0.88-29.30) | 87 (0.007) |
| **1500 m** |  |  |  |  |
| Time s T nmol/L | 18 | 250.0 (245.2-276.7)  0.40 (0.07-0.52) | 247.9 (242.7-272.8)  1.06 (0.86-3.37) | 116 (0.15) |
| **3000 m SC** |  |  |  |  |
| Time s T nmol/L | 16 | 584.5 (551.6-610.3)  0.31 (0.20-0.39) | 579.2 (552.0-612.5)  0.93 (0.71-3.24) | 119 (0.75) |
| **5000 m** |  |  |  |  |
| Time s T nmol/L | 12 | 928.0 (890.2-982.8)  0.39 (0.21-0.50) | 917.1 (891.2-1077.0)  0.83 (0.76-3.82) | 71 (0.98) |
| **10 000 m** |  |  |  |  |
| Time s T nmol/L | 10 | 1914 (1845-2011)  0.28 (0.13-0.45) | 1909 (1849-1977)  0.87 (0.67-1.19) | 51 (0.97) |
| **Marathon** |  |  |  |  |
| Time s T nmol/L | 29 | 9431 (8744-11149)  0.41 (0.15-0.45) | 9562 (8940-13788)  0.84 (0.65-19.96) | 56 (0.16) |

Data are presented as median (min-max). n is the number of athletes in the lowest and highest T tertiles

**Table 3** Results for non-parametric comparison between the lowest and highest T tertiles with regards to athletic performances in female non-running events

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Event | n | Lowest T Tertile | Highest T Tertile | Mann-Withney W (p) values |
| **Discus** |  |  |  |  |
| Distance m T nmol/L | 12 | 58.58 (53.87-66.52)  0.40 (0.24-0.56) | 61.63 (53.69-67.99)  1.05 (0.84-2.00) | 86.5 (0.42) |
| **Hammer Throw** | |  |  |  |
| Distance m T nmol/L | 14 | 66.97 (61.37-74.90)  0.47 (0.29-0.63) | 71.89 (58.63-77.13)  1.23 (1-2.22) | 146 (0.03) |
| **Shot Put** |  |  |  |  |
| Distance m T nmol/L | 14 | 17.43 (15.76-21.24)  0.53 (0.24-0.63) | 18.55 (16.18-20.41)  1.18 (0.88-11.98) | 132 (0.13) |
| **Javelin** |  |  |  |  |
| Distance m T nmol/L | 14 | 59.68 (52.83-68.16)  0.51 (0.16-0.60) | 59.26 (53.70-71.99)  0.99 (0.85-1.19) | 85 (0.57) |
| **Long Jump** |  |  |  |  |
| Distance m T nmol/L | 17 | 6.48 (6.18-6.85)  0.44 (0.27-0.57) | 6.49 (5.93-7.01)  1.15 (0.89-3.10) | 128 (0.58) |
| **Triple Jump** |  |  |  |  |
| Distance m T nmol/L | 14 | 13.88 (13.41-14.89)  0.37 (0.26-0.48) | 14.06 (13.12-14.67)  1.10 (0.87-11.90) | 92.5 (0.82) |
| **High Jump** |  |  |  |  |
| Distance m T nmol/L | 15 | 1.92 (1.78-2.03)  0.42 (0.21-0.56) | 1.88 (1.80-2.03)  1.02 (0.76-2.57) | 105 (0.77) |
| **Pole Vault** |  |  |  |  |
| Distance m T nmol/L | 13 | 4.40 (4.10-4.65)  0.47 (0.33-0.61) | 4.50 (4.25-4.85)  1.11 (0.88-1.57) | 109 (0.22) |
| **20 km RW** |  |  |  |  |
| Time s T nmol/L | 27 | 5551 (5312-6389)  0.56 (0.26-1.01) | 5637 (5345-6315)  0.60 (0.13-1.26) | 412 (0.42) |
| **Heptathlon** |  |  |  |  |
| Point T nmol/L | 15 | 6115 (5190-6880)  0.41 (0.28-0.46) | 6159 (5671-6539)  1.00 (0.76-2.06) | 117 (0.92) |

Data are presented as median (min-max). n is the number of athletes in the lowest and highest T tertiles

**Table 4** Presentation of sttistics for the non-parametric comparison between the lowest and highest T tertiles with regards to the percentage of competition results in relation to the best female result in long sprints (pooled 400m, 400m hurdles), middle distance runs (pooled 800m, 1500m), and in the four running events (400m up to 1500m; n=225).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Pooled Events | n | Lowest T Tertile | Highest T Tertile | Mann-Withney W (p) values |
| **400m and 400m hurdles** |  |  |  |  |
| Percentage of Competition Best  T nmol/L | 38 | 93.3 (63.8-99.1)  0.43 (0.07-0.61) | 95.9 (87.5-100.0)  1.29 (0.86-43.61) | 1026 (0.002) |
| **800m and 1500m** |  |  |  |  |
| Percentage of Competition Best  T nmol/L | 37 | 96.0 (84.1-99.0)  0.41 (0.07-0.53) | 97.5 (87.6-100.0)  1.09 (0.86-29.30) | 930 (0.008) |
| **400m to 1500m** |  |  |  |  |
| Percentage of Competition Best  T nmol/L | 72 | 94.7 (63.8-99.1)  0.42 (0.07-0.61) | 96.7 (87.5-100.0)  1.25 (0.86-43.61) | 3868 (<0.001) |
|  |  |  |  |  |

Data are presented as median (min-max). n is the number of athletes in the lowest and highest T tertiles

**Table 5** Presentation of the results for the non-parametric comparison between the normal range and “high” levels (above the threshold at 2 nmol/L) of testosterone concentration with regard to percentage of competition best in female 400m, 400m hurdles, 800m, 1500m (pooled results).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Event | Normal T  n=206 | | | High T  n=19 | | Mann-Withney W (p) values | |
| **400m to 1500m** |  | | |  | |  | |
| Percentage of Competition Best  T nmol/L | 95.1 (63.8-100.0)  0.64 (0.07-1.89) | | | 96.7 (87.9-99.9)  3.51 (2.07-43.61) | | 2523 (0.037) | |
|  |  |  |  | |  | |

Data are presented as median (min-max). n is the respective number of athletes in the normal and high T groups