PLANTAR FOOT PRESSURE ANALYSIS FOR XING HUINA - THE WOMEN 10000 METER CHAMPION IN ATHENS OLYMPICS

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INTRODUCTION: In the middle-distance race, the running technology of the Athlete plays an important role in the foot pressure distributions. On the side, the movement of the foot pressure also affects the running technology. The two aspects are closely related and interact with each other. In the study of the middle-distance race, the plantar foot pressure analysis has a significant impact on the prevention of the sport injuries and orthopedics.

METHODS: To collect the plantar pressure data from Xing Huina, the footscan® 1 m foot pressure plate was used. Based on the footscan®. The platform was mounted in the middle of a 10 m long EVA running track. Firstly, the static measurement was done by the subject standing on the platform; then the dynamic measurements were done by walking and running through the footscan® plate each 10 times. The average and standard deviation were obtained from10 measurements.

RESULTS AND DISCUSSION: In the static measurement, there were high pressure distributions under the Metatarsal 1 and Metatarsal 2 of right foot, which meant there were higher loadings under the right foot than the left one in the standing phase.
In the dynamic measurements, we can see the peak values of the pressure were distributed as below:

Table 1 Peak value of the pressure of walking.

Zone	Peak Value of intensity of Pressure under Left Foot (unit: N)	Peak Value of intensity of Pressure under Right Foot (unit: N)	The Distinct Difference
Toses	488.83±90.05	551.25±48.48	$p>0.05$
Metas	1369.25± 86.66	1654.75±91	$p<0.05$
Midfoot	185.58±44.77	42.63±93.72	$p<0.05$
Heel	649.25±93.44	770.17±86.64	$p>0.05$

Table 2 Peak value of the pressure of running.

Zone	Peak Value of intensity of Pressure under Left Foot (unit: N)	Peak Value of intensity of Pressure under Right Foot (unit: N)	The Distinct Difference
Toses	338.82±46.31	315.8±44.11	$p<0.05$
Metas	1563.53± 278.74	1769.37±195.32	$p<0.05$
Midfoot	574.60±54.60	542.23±85.77	$p<0.05$
Heel	1076.9±173.70	1152.73±140.4144	$p>0.05$

The results show that there are more body loadings under her right foot than under her left one during normal walking or running. It's imbalance. The fatigue recovery about the foot thenar was not synchronized after increasing the training duration and intensity. The fatigue recovery of the left foot will be better than the right one, so we should more attention to the fatigue recovery of the right foot.
During walking and running, there is also a slight heel eversion followed by an inversion. During the phase from mid-stance to propulsion, a slight pronation takes place. Noteworthy that during the propulsion phase, the value of forefoot pronation mounts to 40%，which overruns the normal range.

CONCLUSION: This study identified that Xing Huina's right foot borne more loading than the left one. During the normal walking and running phase, the values of supination and pronation under the left foot were in the normal range. But it was apparent that the values for the right foot were out of the normal range. We should notice that the higher risks of sport injuries under the right foot during the training.

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