Effects of Core Muscle Strengthening Training on Flexibility, Muscular Strength and Driver Shot Performance in Female Professional Golfers

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The purpose of this study is to investigate the effect of 12 weeks’ combined training in core muscle strengthening on the flexibility, muscular strength, and driver shot performance of the core body parts of the female professional golfers. Subjects were members of the Korea Ladies Professional Golf Association. They were divided into two groups (of whom 9 belonged to the training group, and 8 belonged to the control group). Changes in flexibility (forward flexion and back flexion), maximal muscular strength (back extension and squat), isometric strength (back strength), and core muscle and driver shot performance (ball speed, clubhead speed, and carry distance) were measured before and after 12 weeks’ combined training. The results were as follows: in physical fitness parameters, back flexion and maximal strength of back extension and squat increased significantly in training group following 12 weeks’ core muscle strengthening training. In driver shot performance, clubhead speed and carry distance increased significantly in training group following 12 weeks’ core training. The findings of the present study showed 12 weeks’ combined core muscle training had positive effects on flexibility and strength of core muscle. Moreover, it was effective in enhancing driver shot performance in female professional golfers. This suggests that application of specific and scientific core muscle training should be done continuously in female professional golfers.

key words: Female Professional Golfers, Core Muscle Training, Flexibility, Strength, Driver Shot Performance

Introduction

Golf-related researches are actively conducted internationally, and it can be acknowledged that eleven subdisciplines of golf sciences have been formed since

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World Scientific Congress of Golf in 1990 (Farrally et al., 2003). The numbers of elite golfers are growing fast due to increasing number of games and the prize money for winners. It is assumed that the golfer’s performance can be improved by the levels of techniques and fitness (strength, power, flexibility, endurance) as well as psychological factors (Doan et al., 2006).

Recently, many competitive and star players have appeared continuously at the games of Ladies Professional Golf Association (LPGA) and Korea Ladies Professional Golf Association (KLPGA), and the games become more popular. In the game, ladies should go three consecutive rounds, including the preliminary (예선) and the final (본선), and the importance of physical fitness is being emphasized more than ever. Since players should walk and swing during the 18 hole rounding, physical fitness as well as technique factors are considered to be essential determinants of the outcomes of games (Kim et al., 2007). Previous international (Karen et al., 1999; Fletcher et al., 2004; Thompson et al., 2004) and domestic (Sul, 1994; Shin, 2006; Cho, 2006) studies have emphasized the importance of physical training to performance enhancement. Nevertheless, these studies aimed at investigating the performance enhancement of golfers only utilized traditional training programs and did not employ a scientific training plan in the studies. And, since the studies recruited mainly amateur golfers (Fletcher & Hartwell, 2004; Hetu et al., 1998; Jones, 1998), the results obtained had limitation in applying to elite golfers to measure their performance enhancements. In addition, studies using Korean lady professional golfers are very limited although they are internationally reputable. Thus a scientific fitness training program for the players could not be implied for performance improvement. Subsequently, core training, which was only considered as a part of fitness training program, was not acknowledged, and its effectiveness was neglected (Hibbs et al., 2008).

The most important functional areas considered to improve performance, which should be trained by elite golfers are the lower body and the core muscle. The core muscle is defined as muscles around the spine and the abdomen, and functions essentially to maintain spinal stability and pelvic balance (Akuthota et al., 2008). Since a continuous core muscle recruitment also contributes to coordination of bodily stability and movements during the phase of swing and the impact (Omkar et al., 2009), the core muscle training is considered a very important factor in golfers. As a major injury area of elite golfers is lower back (McHardy et al., 2007), the core muscle strength training may play an important role not only in enhancing