Functional Evaluation Of Shoulder by Constant Score On Bandung Baseball Team

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ABSTRACT

Throwing is a repeatedly movement in Baseball. This activity will make Baseball athlete susceptible to suffer shoulder joint injury. Injuries to the shoulder joint will decrease the function of the shoulder joint. Therefore, it is necessary to do early detection to prevent further injury. Constant score is one method that used to assess the shoulder joint's function. An analytic study performed on eighteen professional Bandung baseball athletes. Constant score form, which was consisted of subjective and objective questionnaires, filled out by the athletes. Scores were obtained from each question and grouped into five, as follow: Poor=<70, Fair=70-79, Good=80-90, Excellent=90-99 and Perfect=100. Range of movement was measured by shoulder joint goniometer. The strength of the shoulder muscle was measured by Push and Pull Dynamometer. Then, the study correlated the pain degree with the training duration. The result shows that mostly athletes were in the Excellent category (83.33%) and the prolonged exercise was negatively correlated (r =-0.459) with the degree of pain. Finally, the study conclude that most of the athletes were in good shoulder joint condition and functional evaluation found that prolonged exercise affect the occurring of pain symptom on shoulder joint of Baseball athletes.

Keywords: *baseball, constant score, pain, shoulder joint.*

1. Introduction

Constant Score was developed by Constant and Murley in 1987 as the one of the first measurement instrument which was developed to asses shoulder function. In 1992 the European Shoulder and Elbow Society mandated the use of the Constant score in all peer-reviewed papers, making it the most widely used shoulder evaluation instrument in Europe. As an outcomes tool, the Constant score is composed by two assessment. This includes (1) subjective assessment that assess level of shoulder pain that is experienced by subject and daily activity restriction due to the pain and (2) objective assessment that assess range of movement of the shoulder and its strength. At the end of assessment, the score that is obtained from these two assessments will be calculated to generate the final Constant Score. Baseball athletes were assessed to represent the Constant score profile of the athlete that use their shoulder function frequently to do pitching or throwing. This repetitive use of shoulder will put their shoulder in the high risk of shoulder injury. According to that fact, it makes the baseball athlete is possible to experience a shoulder function reduction that will be detected by Constant scoring assessment. The act of throwing a baseball is one of the fastest and the most violent maneuvers. In elite pitchers, internal rotation of the shoulder joint can reach velocities as great as 7000 deg/s. The structures of the shoulder should adjust its components to reach sufficient stability to prevent the shoulder from subluxation. In addition, repetitive abduction of the shoulder joint also can make the capsule structures being stiffer. If the motion is too extreme or there is no ability of the shoulder to adjust its structures, it can place the shoulder at risk. Therefore, to increase the quality of the result, this observation was done to the professional baseball team in Bandung, West Java. The team consists of 18 athletes that had been doing a training camp for over two months until observed and analyzed.

2. Method

Eighteen Bandung baseball athletes, taken by total sampling method, were observed after got explained about the Constant score and then the Constant score forms were given to be fulfilled. Subjects were asked to fill the subjective questions about the level of pain and daily activity restriction as the subjective assessment. The subjective question with total score 35 is composed by two components: (1) level of shoulder pain which is experienced by the subject during daily activities; 15 points denoted no pain, 10 point denoted mild pain, 5 point denoted moderate pain and 0 point denoted severe pain; and (2) the ability of the subject to execute and perform activities of daily living was assigned 20 points, with 4 points allocated to work, 4 points allocated to recreational activities, 2 points allocated to sleep and 10 points allocated to level of painless arm use. Subject who can perform work and recreational activities without restriction is given 4 points. Subject whose activities were half restricted is given two points. Subject who experience full restriction on daily activities is given 0 point. Subject whose sleep is uninterrupted is given 2 points. Subject whose sleep is half interrupted is given 1 point. If sleep is heavily is heavily interrupted, there is 0 point given. Subject who can use his arm above the head is given 10 points, 8 points for head level, 6 points for neck level, 4 points for sternum level and 2 points for waist level (see table 1).

Table 1. Subjective assessment of constant score

Function	Points
Ability to work	0-4
Ability to engage in recreational activities	0-4
Ability to sleep	0-2
Ability to work at specific level	
Waist	2
Chest	4
Neck	6
Head	8
Above Head	10
Pain	0-15

After subjective questions were answered then the athletes were demonstrated and instructed to do the procedure of physical examination which later will be used to fill the objective assessment. Objective assessment is assessed with total score 65 which is composed by assessment of range of movement and strength. There are four movements that were assessed in range of movement: (1) Forward Flexion (2) Abduction (3) External Rotation (4) Internal Rotation. The maximal score of each movement is 10 points. The goniometer was used between the medial border of upper arm and the mid-axillary line to measure the degree of forward flexion and abduction movement; 10 points denoted >150°, 8 points denoted 121-150°, 6 points denoted 91-120°, 4 points denoted 61-90°, 2 points denoted 31-60°, and 0 point is given for 0-30° movement. In the other hand, for each rotation movement there are 5 grades degree of rotation that can be assessed. The lowest grade scored 0 and the highest grade scored 10. The strength of shoulder was measured with pull dynamometer which is used in a way drawn or pressed with the position of the upper arm is perpendicular to the ground surface (see table 2).

Table 2. Objective assessment of constant score

Activity	Points
Forward flexion and abduction (scored separately)	
>150°	10
121-150°	8
91-120°	6
61-90°	4
31-60°	2
0-30°	0
External rotation	
Hand behind head, elbow forward	2
Hand behind head, elbow back	4
Hand on top of head, elbow forward	6
Hand on top of head, elbow back	8
Full elevation from top of head	10
Internal rotation	
Interscapular region	10
Twelfth rib	8
Waist	6
Lumbosacral junction	4
Buttock	2
Thigh	0
Strength	1/lb

All scores that were obtained from subjective questions were added to all scores that were obtained from objective questions to get the final constant score. The final score then classified based on the category of the score. Poor category was given to the athlete whose score is <70, fair is 70-79, good is 80-90, excellent is 90-99 and perfect to whose scores 100. Finally, Pearson test conducted to analyze the correlation between the pain and the duration of the athletes' training.

3. Result and Discussion

The score results of the research showed that there is significantly finding of the subjective assessment. The pain level that experienced by the athlete is as expected before. Frequency of athlete in each category is by figure 1.

The result was categorized based on the category of the Constant Score. From eighteen athletes observed, 1 athlete included into fair category, two athletes included into good category, and fifteen athletes included into excellent category, and no one included into poor neither perfect category. Table 3 shows the frequency and percentage of each category.

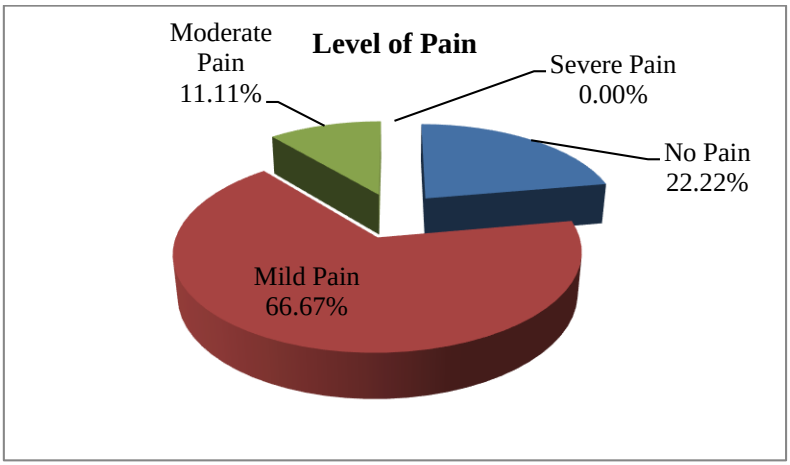

Figure 1. Pain level experienced by the athletes

Table 3. Constant score category of Bandung baseball team

Category	Frequency	Percentage (%)
Poor	0	0
Fair	1	5.56
Good	2	11.11
Excellent	15	83.33
Perfect	0	0

The limitation of this study was the tool that was used for assessing shoulder strength. The Tool that we used is to assess the shoulder strength is pull-push dynamometer. This tool does not require the abduction of shoulder that does not make the shoulder feels pain in its use.

This Constant Score show us that almost every baseball player ever had experienced pain on their shoulder that can cause further injury. We refer to use Constant score in evaluating the shoulder function of Bandung baseball team athletes. From the data that we had obtained, we can conclude that almost every athlete in Bandung baseball team had experienced reduction of shoulder function. It all proved by the final Constant score category we had obtained. Our study showed that shoulder pain was found in almost baseball athlete, 4 athletes (22.22%) experienced no pain in their shoulder but showed a reduction of shoulder function in other assessment and 14 athletes (77.78%) experienced pain in their shoulder with mild to moderate intensity. Pain of the shoulder that experienced by the athletes is suitable with prior study about shoulder pain in the overhead throwing athlete and the thrower‘s shoulder. The use of appropriate tool for assessing shoulder strength is recommended to establish further research. It is also useful to apply this scoring system for athlete need as a preparation to participate in a competition. Early detection of shoulder function reduction is important to prevent the occurring of severe injury, particularly in overhead athlete that frequently use their arm to accomplish the game they play. Thus, the athlete knows how far he can push himself in the practice and competition. The correlation result by Pearson test showed that prolonged training has functional relationship with the occurring of pain symptom ($r = -0.459$). This suggests that attention to the shoulder joint should be better in line with the length and duration of exercise to prevent pain or even injury.

Conclusion and Suggestion

The study conclude that most of the athletes were in good shoulder joint condition and functional evaluation found that prolonged exercise affect the occurring of pain symptom on shoulder joint of Baseball athletes.

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