Original article:

Patterns of Blood Pressure of Young Sports Persons of Dinajpur BKSP

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Abstract

Objectives: Hypertension (HTN)/ high blood pressure (BP) is the most common cardiovascular condition affecting athletes. It is one of the critical challenges to care of a young athlete with high BP readings. For young competitive athletes, BP measurement should be performed during the pre-participation physical examination (PPE). BP has a significant influence of the physiological response to exercise. For child and adolescent athletes, an annual PPE is recommended by Sports medicine organizations. The aim of the study was to observe the patterns of present BP of the young sports persons of Dinajpur BKSP, Bangladesh. ***Materials and methods:*** This study was cross-sectional with convenient sampling technique and BP was measured by Auscultatory method. ***Results and Discussion:*** The results Showed no significant difference in diastolic BP among the young sports person of Dinajpur BKSP. A slight high systolic BP was observed only in one cricket student (130 mm Hg) which might be needed further investigation. ***Conclusion:*** Detecting high BP early will improve a child's health. Early diagnosis and treatment can reduce or prevent the harmful consequences of this disease. For young athletes, BP should be measured annually to maintain their resting heart rate in normal limit for fitness.

Keywords: Blood pressure; HTN; Young Sports Persons; BKSP.

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Introduction

Hypertension (HTN) is among the most common conditions seen in primary care and the most common cardiovascular condition affecting athletes.[1,2,3] In due course, we will be challenged with the opportunity to contribute in the care of a young athlete with high blood pressure (BP) readings, whom you see because a medical evaluation is essential for him or her to participate in a sports program.[4] For young competitive athletes, pre-participation cardiovascular screening is justifiable and compelling on ethical, legal, and medical grounds according to "The 1996 American Heart Association consensus panel recommendations".[5] Current screening approvals for athletes specify that a BP measurement be performed during the pre-participation physical examination (PPE)[1] and it is the standard of care for the millions of high school students in the United States as they prepare for athletic participation.[6] For child and adolescent athletes, an annual PPE is recommended by Sports medicine organizations.[3]

The patterns of BP among adult populations in Asian countries were evaluated.[7] In young adults, poor fitness is associated with the development of cardiovascular disease risk factors. These associations involve obesity and may be modified by improving fitness.[8] The measurement of BP gives the therapist/coach information regarding the athlete's baseline cardiovascular status, response to exercise/ activity, and guides exercise prescription. Exercise scientist is most particularly interested to assess the systolic and diastolic BP patterns regularly. In the light of researchers own knowledge of the field of study, experts opinion, administrative feasibility and availability of instruments/equipment, the scholar decided to adopt BP patterns for assessing the blood pressure of the young sports persons of Dinajpur BKSP, Bangladesh.

Methodology

This study was cross-sectional, quantitative (descriptive – subjects usually measured once) study. The project was approved by the department of Exercise Physiology, Bangladesh Institute of Sports (BKSP).

The sampling technique was convenient and the subjects for the study were selected from football

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(n=27), cricket (n=10), and swimming (n=9) players of Dinajpur BKSP, Bangladesh according to availability. Inform consent was taken from every participant before starting measurement. The age ranges of the subjects were 8 to 15 years.

To ensure maximum cooperation from sports persons, the investigator met with the young sports persons of Dinjpur BKSP, Bangladesh in the presence of their respective coach. The purpose of the study was clearly explain to them, so that, there was no confusion among the sports persons to attend in the study. All the subjects' voluntarily agreed to do full cooperation. And then data was collected by taking the measurement of systolic and diastolic BP by Auscultatory method and Sphygmomanometer (Alpha-k_2, Japan), and Stethoscope (Litman, Japan) were used. The BP was measured and recorded at least twice on each measurement occasion, and the average of these two measurements is the measurement for systolic and diastolic BP. This average was used for analysis. Before each examination, children's were asked to fast for at least 2 hours and not to smoke or engage in heavy physical activity for at least 2 hours prior to the examination.

BP almost always is measured in millimeters of mercury (mmHg) because the mercury manometer has been used since antiquity as the standard reference for measuring pressure.[9] The inflatable cuff (5, 18 cm cuff) was wrapped snugly around the upper part of the left arm just above the elbow joints that covers the two-third of arm. The stethoscope was placed on the tester's ears. The stethoscope bell was placed firmly over the brachial artery just above the elbow slightly towards the inside of the arm. The cuff was rapidly pumped up with instrument bulb until no pulse beat can be heard. Then pressure was released slowly and careful observation was done on the dial. When the 1st pulse sound was heard, the position of the needle on the dial was read. It was the systolic BP, recorded in mmHg. It was continued slowly to release the pressure in the cuff, when a dull force less beat was noted the position of the needle on the dial was against read. This was the diastolic pressure.

Data were collected carefully as much as possible and the collected data (raw data) used for analysis. Collected data were transferred into the frequency table for calculating the patterns of systolic and diastolic BP respectively. Data were statistically analyzed for Mean, Standard deviation (SD), Maximum, and Minimum to evaluate the patterns of systolic and diastolic BP respectively.

Results

Results were revealed from 46 subjects in the area of football, cricket & swimming. The data was analyzed to find out present BP patterns of potential sportspersons of Dinajpur BKSP, Bangladesh. The results are shown on the table 1 and figure 1.

The study shown that, the average BP for all the young Footballers, Cricketers & Swimmers were 94.5, 104.5 & 94.5 mmHg respectively for systolic pressure with a SD of 10.63, 14.46, & 6.25, whereas the average diastolic pressures were 64.5 mmHg for all the sports persons with a SD of 6.32, 8.31, & 4.69 respectively. There were no significant differences in diastolic BP among the young sports person. A slight high systolic BP was observed only in one cricket student (130 mm Hg). Overall, all of them were having normal BP.

Table1: Mean, SD, Maximum, and Minimum for systolic pressure and diastolic pressure of Young Footballer's, Cricketers and Swimmers of Dinajpur BKSP:

Patterns of BP	*Systolic BP*			*Diastolic BP*		
	Footballer's	*Cricketers*	*Swimmers*	*Footballer's*	*Cricketers*	*Swimmers*
Mean	100.43	103.5	96.72	65.6	65.5	65.6
Standard Deviation (SD)	10.63	14.46	6.25	6.32	8.31	4.69
Maximum	110	130	100	75	80	70
Minimum	80	80	85	50	50	50

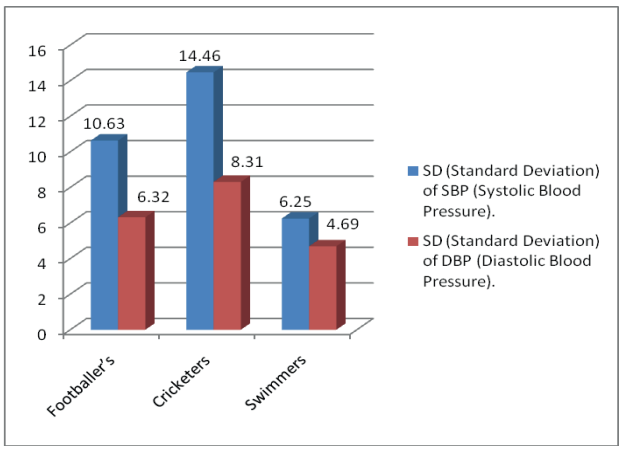

Figure 1: SD (Standard Deviation) of SBP (Systolic Blood Pressure) and DBP (Diastolic Blood Pressure).

Discussion

The results were clearly shown that the young footballers, cricketers and swimmers of Dinajpur BKSP have normal BP. This gives an idea about BP patterns of Dinajpur BKSP students. In the present study revealed that, the average BP for all the young Footballers, Cricketers & Swimmers were 94.5, 104.5 & 94.5 mmHg respectively for systolic pressure with a SD of 10.63, 14.46, & 6.25,whereas the average diastolic pressures were 64.5 mmHg for all the sports persons with a SD of 6.32, 8.31, & 4.69 respectively.

The results were shown no significant differences in diastolic BP among the young sports person of Dinajpur BKSP. A slight high systolic BP was observed only in one cricket student (130 mm Hg) which might be needed further investigation. Overall, all of them were having normal BP. Paul Muntner et al. (2004) concluded, in the United States, systolic and diastolic BP has increased markedly among children and adolescents. The mean (SE) systolic BP was 106.0 (0.3) mm Hg and diastolic BP was 61.7 (0.5) mm Hg in 1999-2000.[10]

The essential parameters defining hypertension in both adults and children do not differ in athletes.[3] In the adult, hypertension is defined as a systolic blood pressure (SBP) ≥140 mmHg or a diastolic blood pressure (DBP) ≥90 mmHg on each of two or more office visits.[3,11,12,13] Several children and adolescents with asymptomatic hypertension are identified during well- child visits or sports physicals. Therefore, BP measurement is a routine part of pediatric well-child care.[14] BPs measured during routine PPEs for high school sports are a useful tool in screening for elevated BP in adolescents. Fifty-seven of the athletes (12.2%) from 467 adolescents athletes had significantly elevated BPs during PPEs for high school sports. 79.6% of 54 subjects revealed significantly and persistently elevated BPs at 1-year follow-up.[15] The West Virginia University Department of Intercollegiate Athletics showed that, the most common medical condition (47.8%) was elevated BP during prospective recording of collegiate PPEs over a 2-years period.[16]

Teens, children and even babies can have high BP. The American Heart Association recommends that all the children should measure BP yearly. Early detection of high BP will improve a child's health. Early identification and treatment of high BP can decrease or prevent the harmful consequences of this disease.[17] Fitness and physical activity are each inversely associated with the development of hypertension and low fitness may account for a substantial proportion of hypertension incidence.[18] Therefore it is important to measure BP for every child especially for sports person regularly.

With comparison to the previous studies, this study possessed normal BP pattern of young sports persons of Dinajpur BKSP and they have good cardiovascular fitness.

Time and participants were limited of this study. Few researches have only been worked on this similar topic. The results were tough to interpret properly. Therefore, the findings of the present study would not be generalized to the whole sports persons of BKSP and worldwide. However, this study would be a milestone for future study. Further study should be recommended with large sample size.

Conclusions

Young sports persons of Dinajpur BKSP possessed normal blood pressure. Normal blood pressure is very essential for a person to maintain the normal physiological function of the body. A slight change in blood pressure especially in diastolic blood pressure may cause pathological appearance of the different physiological and metabolic functions of the body. Therefore, it is recommended to measure blood pressure regularly, students should participate in some kind of exercise in order to maintain their resting heart rate in normal limit. It is suggested that an increase in fruit and vegetable intake can help to lower blood pressure.

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