Supplemental material

Figure 1.

History

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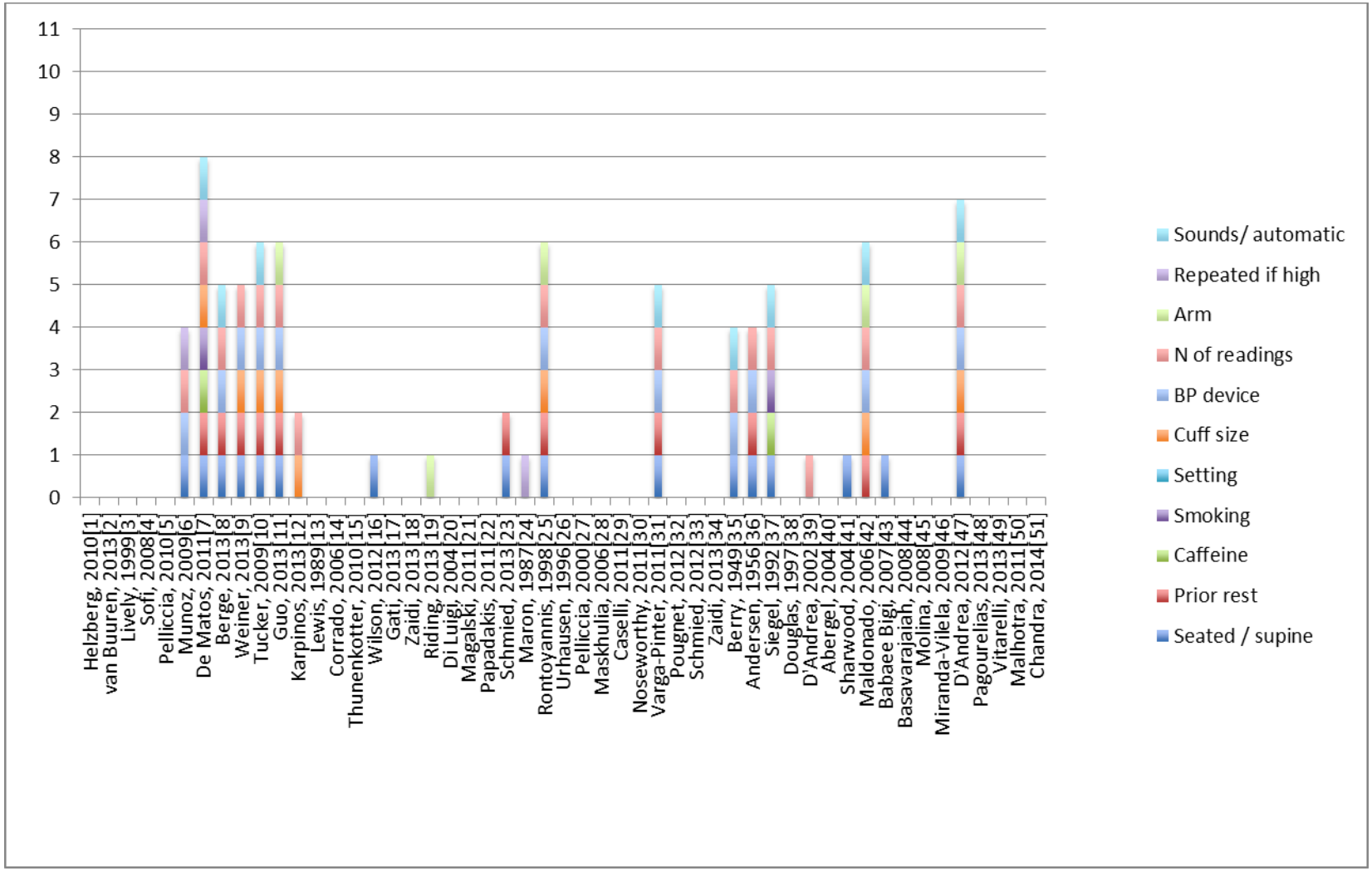
Recent queries

Search	Add to builder	Query	Items found	Time
#15	Add	Search (((((athlete) OR ((sports) AND ((((professional) OR "sudden death") OR screening) OR "exercise test")))) AND (("blood pressure") OR hypertension))) AND english[Language]	2576	08:47:10
#14	Add	Search english[Language]	19275775	08:47:01
#13	Add	Search (((athlete) OR ((sports) AND ((((professional) OR "sudden death") OR screening) OR "exercise test")))) AND (("blood pressure") OR hypertension)	2945	08:46:42
#12	Add	Search ("blood pressure") OR hypertension	614535	08:46:31
#11	Add	Search hypertension	378438	08:46:26
#10	Add	Search "blood pressure"	360002	08:46:21
#9	Add	Search (athlete) OR ((sports) AND ((((professional) OR "sudden death") OR screening) OR "exercise test"))	69285	08:46:08
#8	Add	Search (sports) AND ((((professional) OR "sudden death") OR screening) OR "exercise test")	48024	08:45:51
#7	Add	Search (((professional) OR "sudden death") OR screening) OR "exercise test"	5210365	08:45:28
#6	Add	Search "exercise test"	52975	08:45:12
#5	Add	Search screening	4958830	08:44:54
#4	Add	Search "sudden death"	31217	08:44:48
#3	Add	Search professional	225442	08:44:39
#2	Add	Search sports	178760	08:44:33
#1	Add	Search athlete	30498	08:44:17

Figure 2.

28	limit 27 to english language	1857	Advanced
27	21 and 26	2154	Advanced
26	22 or 23 or 24 or 25	893067	Advanced
25	hypertension.tw.	367161	Advanced
24	exp hypertension/	480099	Advanced
23	blood pressure.tw.	278656	Advanced
22	exp blood pressure/	389166	Advanced
21	5 or 8 or 12 or 16 or 20	51522	Advanced
20	3 and 19	3433	Advanced
19	17 or 18	51476	Advanced
18	exercise test*.tw.	24105	Advanced
17	exercise test/	40223	Advanced
16	3 and 15	1345	Advanced
15	13 or 14	429626	Advanced
14	screening.tw.	414827	Advanced
13	screening test/	47117	Advanced
12	3 and 11	1136	Advanced
11	9 or 10	45710	Advanced
10	sudden death.tw.	22376	Advanced
9	exp sudden death/	37995	Advanced
8	6 or 7	4013	Advanced
7	3 and 4	3871	Advanced
6	professional sport*.tw.	337	Advanced
5	1 or 2	45911	Advanced
4	professional.tw.	128682	Advanced
3	exp sport/	99668	Advanced
2	athlete*.tw.	35090	Advanced
1	athlete/	29846	Advanced

Figure 3.


11
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Helzberg, 2010 [1]
van Buuren, 2013 [2]
Lively, 1999 [3]
Sofi, 2008 [4]
Pelliccia, 2010 [5]
Munoz, 2009 [6]
De Matos, 2011 [7]
Berge, 2013 [8]
Weiner, 2013 [9]
Tucker, 2009 [10]
Guo, 2013 [11]
Karpinos, 2013 [12]
Lewis, 1989 [13]
Corrado, 2006 [14]
Thunenkotter, 2010 [15]
Wilson, 2012 [16]
Gati, 2013 [17]
Zaidi, 2013 [18]
Riding, 2013 [19]
Di Luigi, 2004 [20]
Magalski, 2011 [21]
Papadakis, 2011 [22]
Schmied, 2013 [23]
Maron, 1987 [24]
Rontoyannis, 1998 [25]
Urhausen, 1996 [26]
Pelliccia, 2000 [27]
Maskhulia, 2006 [28]
Caselli, 2011 [29]
Noseworthy, 2011 [30]
Varga-Pinter, 2011 [31]
Pougnet, 2012 [32]
Schmied, 2012 [33]
Zaidi, 2013 [34]
Berry, 1949 [35]
Andersen, 1956 [36]
Siegel, 1992 [37]
Douglas, 1997 [38]
D'Andrea, 2002 [39]
Abergel, 2004 [40]
Sharwood, 2004 [41]
Maldonado, 2006 [42]
Babaee Bigi, 2007 [43]
Basavarajaiah, 2008 [44]
Molina, 2008 [45]
Miranda-Vilela, 2009 [46]
D'Andrea, 2012 [47]
Pagourelias, 2013 [48]
Vitarelli, 2013 [49]
Malhotra, 2011 [50]
Chandra, 2014 [51]
Sounds/ automatic
Repeated if high
Arm
N of readings
BP device
Cuff size
Setting
Smoking
Caffeine
Prior rest
Seated / supine

References

1 Helzberg JH, Waeckerle JF, Camilo J, et al. Comparison of cardiovascular and metabolic risk factors in professional baseball players versus professional football players. *Am J Cardiol* 2010;**106**:664-7.

2 van Buuren F., Mellwig KP, Butz T, et al. Left ventricular mass and oxygen uptake in top handball athletes. *Int J Sports Med* 2013;**34**:200-6.

3 Lively MW. Preparticipation physical examinations: a collegiate experience. *Clin J Sport Med* 1999;**9**:3-8.

4 Sofi F, Capalbo A, Pucci N, et al. Cardiovascular evaluation, including resting and exercise electrocardiography, before participation in competitive sports: cross sectional study. *BMJ* 2008;**337**:a346.

5 Pelliccia A, Kinoshita N, Pisicchio C, et al. Long-term clinical consequences of intense, uninterrupted endurance training in olympic athletes. *J Am Coll Cardiol* 2010;**55**:1619-25.

6 Munoz L, Norgan G, Rauschhuber M, et al. An exploratory study of cardiac health in college athletes. *Appl Nurs Res* 2009;**22**:228-35.

7 De Matos LD, Caldeira NA, Perlingeiro PS, et al. Cardiovascular risk and clinical factors in athletes: 10 years of evaluation. *Med Sci Sports Exerc* 2011;**43**:943-50.

8 Berge HM, Gjerdalen GF, Andersen TE, et al. Blood pressure in professional male football players in Norway. *J Hypertens* 2013;**31**:672-9.

9 Weiner RB, Wang F, Isaacs SK, et al. Blood pressure and left ventricular hypertrophy during american-style football participation. *Circulation* 2013;**128**:524-31.

10 Tucker AM, Vogel RA, Lincoln AE, et al. Prevalence of cardiovascular disease risk factors among National Football League players. *JAMA* 2009;**301**:2111-9.

11 Guo J, Zhang X, Wang L, et al. Prevalence of metabolic syndrome and its components among Chinese professional athletes of strength sports with different body weight categories. *PLoS One* 2013;**8**:e79758.

12 Karpinos AR, Roumie CL, Nian H, et al. High prevalence of hypertension among collegiate football athletes. *Circ Cardiovasc Qual Outcomes* 2013;**6**:716-23.

13 Lewis JF, Maron BJ, Diggs JA, et al. Preparticipation echocardiographic screening for cardiovascular disease in a large, predominantly black population of collegiate athletes. *Am J Cardiol* 1989;**64**:1029-33.

14 Corrado D, Basso C, Pavei A, et al. Trends in sudden cardiovascular death in young competitive athletes after implementation of a preparticipation screening program. *JAMA* 2006;**296**:1593-601.

15 Thunenkotter T, Schmied C, Dvorak J, et al. Benefits and limitations of cardiovascular pre-competition screening in international football. *Clin Res Cardiol* 2010;**99**:29-35.

16 Wilson MG, Chatard JC, Carre F, et al. Prevalence of electrocardiographic abnormalities in West-Asian and African male athletes. *Br J Sports Med* 2012;**46**:341-7.

17 Gati S, Sheikh N, Ghani S, et al. Should axis deviation or atrial enlargement be categorised as abnormal in young athletes? The athlete's electrocardiogram: time for re-appraisal of markers of pathology. *Eur Heart J* 2013.

18 Zaidi A, Ghani S, Sheikh N, et al. Clinical significance of electrocardiographic right ventricular hypertrophy in athletes: comparison with arrhythmogenic right ventricular cardiomyopathy and pulmonary hypertension. *Eur Heart J* 2013.

19 Riding NR, Salah O, Sharma S, et al. ECG and morphologic adaptations in Arabic athletes: are the European Society of Cardiology's recommendations for the interpretation of the 12-lead ECG appropriate for this ethnicity? *Br J Sports Med* 2013.

20 Di Luigi L, Pelliccia A, Bonetti A, et al. Clinical efficacy and preventive role of the pre-participation physical examination in Italy. *Med Sport* 2004;**57**:243-70.

21 Magalski A, McCoy M, Zabel M, et al. Cardiovascular screening with electrocardiography and echocardiography in collegiate athletes. *Am J Med* 2011;**124**:511-8.

22 Papadakis M, Carre F, Kervio G, et al. The prevalence, distribution, and clinical outcomes of electrocardiographic repolarization patterns in male athletes of African/Afro-Caribbean origin. *Eur Heart J* 2011;**32**:2304-13.

23 Schmied C, Di Paolo FM, Zerguini AY, et al. Screening athletes for cardiovascular disease in Africa: a challenging experience. *Br J Sports Med* 2013;**47**:579-84.

24 Maron BJ, Bodison SA, Wesley YE, et al. Results of screening a large group of intercollegiate competitive athletes for cardiovascular disease. *J Am Coll Cardiol* 1987;**10**:1214-21.

25 Rontoyannis GP, Stalikas A, Sarros G, et al. Medical, morphological and functional aspects of Greek football referees. *J Sports Med Phys Fitness* 1998;**38**:208-14.

26 Urhausen A, Monz T, Kindermann W. Sports-specific adaptation of left ventricular muscle mass in athlete's heart. I. An echocardiographic study with combined isometric and dynamic exercise trained athletes (male and female rowers). *Int J Sports Med* 1996;**17 Suppl 3**:S145-S151.

27 Pelliccia A, Maron BJ, Culasso F, et al. Clinical significance of abnormal electrocardiographic patterns in trained athletes. *Circulation* 2000;**102**:278-84.

28 Maskhulia L, Chabashvili N, Kakhabrishvili Z, et al. Electrocardiographic patterns and systolic and diastolic functions of the heart in the highly trained football players with increased left ventricular mass. *Georgian Med News* 2006;76-80.

29 Caselli S, Di PR, Di Paolo FM, et al. Left ventricular systolic performance is improved in elite athletes. *Eur J Echocardiogr* 2011;**12**:514-9.

30 Noseworthy PA, Weiner R, Kim J, et al. Early repolarization pattern in competitive athletes: clinical correlates and the effects of exercise training. *Circ Arrhythm Electrophysiol* 2011;**4**:432-40.

31 Varga-Pinter B, Horvath P, Kneffel Z, et al. Resting blood pressure values of adult athletes. *Kidney Blood Press Res* 2011;**34**:387-95.

32 Pougnet R, Costanzo LD, Lodde B, et al. Cardiovascular risk factors and cardiovascular risk assessment in professional divers. *Int Marit Health* 2012;**63**:164-9.

33 Schmied C, Notz S, Cribari M, et al. Cardiac pre-competiton screening in Swiss athletes. Current situation in competitive athletes and short-time assessment of an exemplary local screening program. *Swiss Med Wkly* 2012;**142**:w13575.

34 Zaidi A, Ghani S, Sharma R, et al. Physiologic Right Ventricular Adaptation in Elite Athletes of African and Afro-Caribbean Origin. *Circulation* 2013.

35 BERRY WT, BEVERIDGE JB, . The diet, haemoglobin values, and blood pressure of Olympic athletes. *Br Med J* 1949;**1**:300-4.

36 Andersen KL, Elvik A. The resting arterial blood pressure in athletes. *Acta Med Scand* 1956;**153**:367-71.

37 Siegel D, Benowitz N, Ernster VL, et al. Smokeless tobacco, cardiovascular risk factors, and nicotine and cotinine levels in professional baseball players. *Am J Public Health* 1992;**82**:417-21.

38 Douglas PS, O'Toole ML, Katz SE, et al. Left ventricular hypertrophy in athletes. *Am J Cardiol* 1997;**80**:1384-8.

39 D'Andrea A, Limongelli G, Caso P, et al. Association between left ventricular structure and cardiac performance during effort in two morphological forms of athlete's heart. *Int J Cardiol* 2002;**86**:177-84.

40 Abergel E, Chatellier G, Hagege AA, et al. Serial left ventricular adaptations in world-class professional cyclists: implications for disease screening and follow-up. *J Am Coll Cardiol* 2004;**44**:144-9.

41 Sharwood KA, Collins M, Goedecke JH, et al. Weight changes, medical complications, and performance during an Ironman triathlon. *Br J Sports Med* 2004;**38**:718-24.

42 Maldonado J, Pereira T, Polonia J, et al. Modulation of arterial stiffness with intensive competitive training. *Rev Port Cardiol* 2006;**25**:709-14.

43 Babaee Bigi MA, Aslani A. Aortic root size and prevalence of aortic regurgitation in elite strength trained athletes. *Am J Cardiol* 2007;**100**:528-30.

44 Basavarajaiah S, Boraita A, Whyte G, et al. Ethnic differences in left ventricular remodeling in highly-trained athletes relevance to differentiating physiologic left ventricular hypertrophy from hypertrophic cardiomyopathy. *J Am Coll Cardiol* 2008;**51**:2256-62.

45 Molina L, Mont L, Marrugat J, et al. Long-term endurance sport practice increases the incidence of lone atrial fibrillation in men: a follow-up study. *Europace* 2008;**10**:618-23.

46 Miranda-Vilela AL, Pereira LC, Goncalves CA, et al. Pequi fruit (Caryocar brasiliense Camb.) pulp oil reduces exercise-induced inflammatory markers and blood pressure of male and female runners. *Nutr Res* 2009;**29**:850-8.

47 D'Andrea A, Cocchia R, Riegler L, et al. Aortic stiffness and distensibility in top-level athletes. *J Am Soc Echocardiogr* 2012;**25**:561-7.

48 Pagourelias ED, Kouidi E, Efthimiadis GK, et al. Right atrial and ventricular adaptations to training in male Caucasian athletes: an echocardiographic study. *J Am Soc Echocardiogr* 2013;**26**:1344-52.

49 Vitarelli A, Capotosto L, Placanica G, et al. Comprehensive assessment of biventricular function and aortic stiffness in athletes with different forms of training by three-dimensional echocardiography and strain imaging. *Eur Heart J Cardiovasc Imaging* 2013;**14**:1010-20.

50 Malhotra R, West JJ, Dent J, et al. Cost and yield of adding electrocardiography to history and physical in screening Division I intercollegiate athletes: A 5-year experience. *Heart Rhythm* 2011;**8**:721-7.

51 Chandra N, Bastiaenen R, Papadakis M, et al. The prevalence of ECG anomalies in young individuals; Relevance to a nationwide cardiac screening program. *J Am Coll Cardiol* 2014.

Figure legends for supplemental materials

Figure 1.

Search strategy PubMed, updated 6th of April 2014.

Figure 2.

Search strategy EMBASE, updated 6th of April 2014.

Figure 3.

Methodological elements of blood pressure measurements described in the different studies