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ARTIFICIAL TURF VS NATURAL GRASS: MOVEMENT PATTERNS, TECHNICAL STANDARDS, AND PLAYER IMPRESSIONS

Journal of Sports Sciences, January 13th 2019, 36(2): 119-122

Elite football on artificial turf versus natural grass: Movement patterns, technical standards, and player impressions

MILÉNA ANDERSSON*, BJÖRN EKHOLM[†], & PETER KRUTRUP[‡]

^{*}Department of Health Sciences, Örebro University, Örebro, Sweden, [†]Stockholm University College of Physical Education and Sports, Stockholm, Sweden and [‡]Institute of Exercise and Sport Science, University of Copenhagen, Copenhagen, Denmark (Accepted 27 April 2018)

Abstract
The aim of the present study was to examine the movement patterns, ball skills, and player impressions during professional games on artificial and natural grass. Three elite football clubs (18 team members) were followed on 21 dates on 11 matches. The data were analysed using global positioning system (GPS) and video analysis. The results showed that movement patterns, ball skills, and player impressions were different between artificial and natural grass. The results also showed that player impressions were different between artificial and natural grass. The results also showed that player impressions were different between artificial and natural grass.

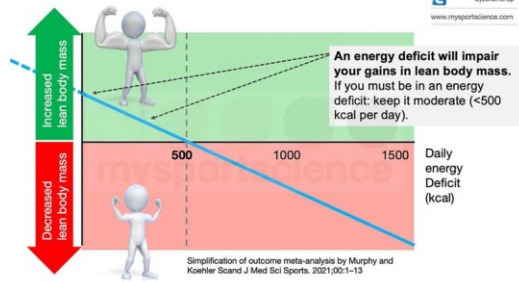
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Introduction
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Conclusion
The results showed that movement patterns, ball skills, and player impressions were different between artificial and natural grass. The results also showed that player impressions were different between artificial and natural grass.

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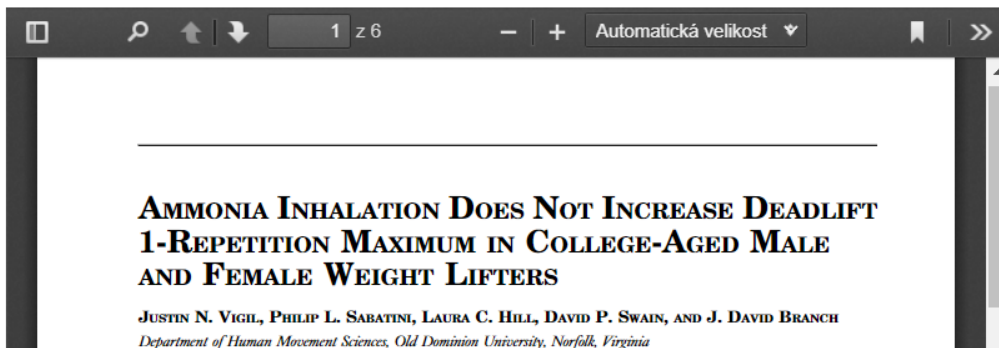
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AMMONIA INHALATION DOES NOT INCREASE DEADLIFT 1-REPETITION MAXIMUM IN COLLEGE-AGED MALE AND FEMALE WEIGHT LIFTERS

JUSTIN N. VIGIL, PHILIP L. SABATINI, LAURA C. HILL, DAVID P. SWAIN, AND J. DAVID BRANCH

Department of Human Movement Sciences, Old Dominion University, Norfolk, Virginia

PRACTICAL APPLICATIONS

Although AI use is prevalent among certain strength and power athletes, the ergogenic effects of its use on weightlifting performance has received little research attention. This study reported no improvement in deadlift 1RM after AI. Based on this finding, there is no rationale to recommended AI use to strength and power athletes for improved deadlift performance.

ABSTRACT

Vigil, JN, Sabatini, PL, Hill, LC, Swain, DP, and Branch, JD. Ammonia inhalation does not increase deadlift 1-repetition maximum in college-aged male and female weight lifters. *J Strength Cond Res* 32(12): 3392–3397, 2018—Ammonia inhalant use by powerlifters and weight lifters is a prevalent practice with little research support for improved performance. The purpose of this study was to investigate the effects of ammonia as a stimulant on athletic performance during a deadlift 1-repetition maximum (1RM) absolute strength test. Subjects (men: $n = 10$, mean \pm SD age = 21 ± 1 year, mass = 72.5 ± 6.8 kg; and women: $n = 10$, age = 22 ± 5 years, mass = 66.2 ± 8.1 kg) were required to have at least 2 years of resistance training experience while lacking a history of asthma, lightheadedness, fainting, anaphylaxis, sickle cell traits, and other respiratory disorders. After a baseline 1RM test, subjects were paired by 1RM performance and gender, then randomly assigned in a counter-balanced treatment order to control (water) or ammonia trials after a minimum 72-hour recovery period for another 1RM test involving attempts at 100.0, 102.5, 105.0, and 107.5% of the established 1RM value. Testing was then repeated after the minimum rest period for the remaining trial. Results revealed the expected gender main effect for absolute deadlift 1RM (93.0 ± 29.5 [women]; 152.0 ± 29.5 kg [men]; $p < 0.001$), but no trial main effect ($p = 0.874$) or gender by trial interaction effect (baseline = 93.0 ± 15.3 , 151.8 ± 42.3 kg; water = 92.0 ± 12.5 , 150.9 ± 37.8 kg; ammonia = 92.5 ± 16.4 , 153.4 ± 37.9 kg) for women and men, respectively ($p = 0.559$). Within the limitations of this study, there is no support for the practice of ammonia inhalation to improve deadlift 1RM in training or competition.

KEY WORDS powerlifting, weight lifting, strength, ergogenic aids

AMMONIA INHALATION DOES NOT INCREASE DEADLIFT 1-REPETITION MAXIMUM IN COLLEGE-AGED MALE AND FEMALE WEIGHT LIFTERS

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KEY WORDS powerlifting, weight lifting, strength, ergogenic aids

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INTRODUCTION

Competitive powerlifting combines the maximal mass successfully lifted in a squat, bench press, and deadlift. Powerlifting is an international sport with the World Powerlifting Congress reporting 46 affiliate member countries (27). The 2015 International and US Powerlifting Championship events reported more than 750 and almost 1,000 competitors, respectively (correspondence from Robert Keller, Secretary General, International Powerlifting Federation, March 9, 2016). Powerlifters, similar to athletes in other sports, seek ergogenic aids to gain an edge over their competitors. Several ergogenic aids used by powerlifters and other athletes such as anabolic-androgenic steroids, prohormones, human growth hormone, insulin-like growth factors, etc. have well-documented adverse health effects and/or provide an unfair competitive advantage (5). Other ergogenic aids appear to have little to no risk but also lack scientific evidence for an ergogenic effect (21). Evidence for the efficacy of any ergogenic aid used by athletes today ranges from a large body of scientific support to only anecdotal testimonials.

Although some ergogenic aids are banned in training and competition by the World Anti-Doping Agency, others, including ammonia inhalant (AI) use, are not banned and are used in competition by powerlifters (16,26). In their international survey of powerlifters, Pritchard et al. (22) revealed that 49% of all respondents used AI, 78% of users felt AI use was ergogenic, and 80% of all respondents indicated AI use was a safe practice. AI was typically used for 2–3 lifts during a competition (45% of AI users) and before the deadlift, the last event in powerlifting competitions. AI use by powerlifters is acknowledged by the International Powerlifting Federation Technical rules book (12), which states that “a lifter shall not ... use ammonia within view of the public.” Physiological effects of AI include irritation of the nasal cavity and lungs resulting in momentary increased inspiration, respiration rate, and alertness (12). Perry et al. (19) reported increased middle cerebral artery blood flow velocity and increased heart rate after AI. The role of these physiological effects in improved powerlifting performance remains to be elucidated.

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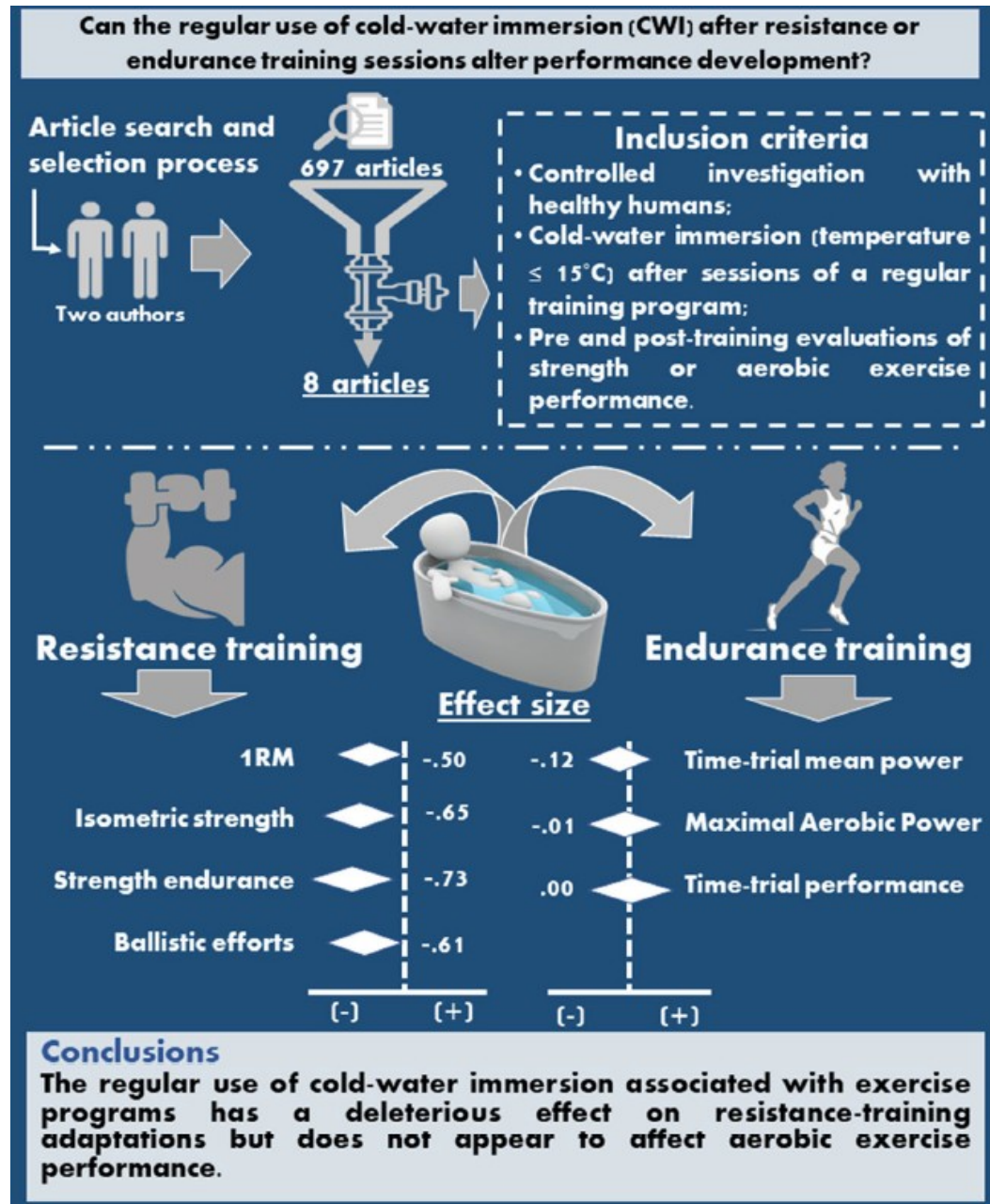
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Background Cold-water immersion (CWI) is one of the main recovery methods used in sports, and is commonly utilized as a means to expedite the recovery of performance during periods of exercise training. In recent decades, there have been indications that regular CWI use is potentially harmful to resistance training adaptations, and, conversely, potentially beneficial to endurance training adaptations. The current meta-analysis was co ... [Show more](#)



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- Ponoření do studené vody nemá vliv na aerobní výkonnost (i.e., time-trial performance and maximal aerobic power).

Sports Medicine (2021) 51:161–174
https://doi.org/10.1007/s40279-020-01362-0

SYSTEMATIC REVIEW



The Effects of Regular Cold-Water Immersion Use on Training-Induced Changes in Strength and Endurance Performance: A Systematic Review with Meta-Analysis

Elvis S. Malta¹ · Yago M. Dutra¹ · James R. Broatch^{2,3} · David J. Bishop² · Alessandro M. Zagatto¹

Published online: 4 November 2020
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Abstract

Background Cold-water immersion (CWI) is one of the main recovery methods used in sports, and is commonly utilized as a means to expedite the recovery of performance during periods of exercise training. In recent decades, there have been indications that regular CWI use is potentially harmful to resistance training adaptations, and, conversely, potentially beneficial to endurance training adaptations. The current meta-analysis was conducted to assess the effects of the regular CWI use during exercise training on resistance (i.e., strength) and endurance (i.e., aerobic exercise) performance alterations.

Methods A computerized literature search was conducted, ending on November 25, 2019. The databases searched were MEDLINE, Cochrane Central Register of Controlled Trials, and SPORTDiscus. The selected studies investigated the effects of chronic CWI interventions associated with resistance and endurance training sessions on exercise performance improvements. The criteria for inclusion of studies were: (1) being a controlled investigation; (2) conducted with humans; (3) CWI performed at ≤ 15 °C; (4) being associated with a regular training program; and (5) having performed baseline and post-training assessments.

Results Eight articles were included before the review process. A harmful effect of CWI associated with resistance training was verified for *one-repetition maximum*, *maximum isometric strength*, and *strength endurance* performance (overall standardized mean difference [SMD] = -0.60 ; Confidence interval of 95% [CI95%] = $-0.87, -0.33$; $p < 0.0001$), as well as for *Ballistic efforts* performance (overall SMD = -0.61 ; CI95% = $-1.11, -0.11$; $p = 0.02$). On the other hand, selected studies verified no effect of CWI associated with endurance training on *time-trial* (mean power), *maximal aerobic power in graded exercise test* performance (overall SMD = -0.07 ; CI95% = $-0.54, 0.53$; $p = 0.71$), or *time-trial* performance (duration) (overall SMD = 0.00 ; CI95% = $-0.58, 0.58$; $p = 1.00$).

Conclusions The regular use of CWI associated with exercise programs has a deleterious effect on resistance training adaptations but does not appear to affect aerobic exercise performance.

Trial Registration PROSPERO CRD42018098898.

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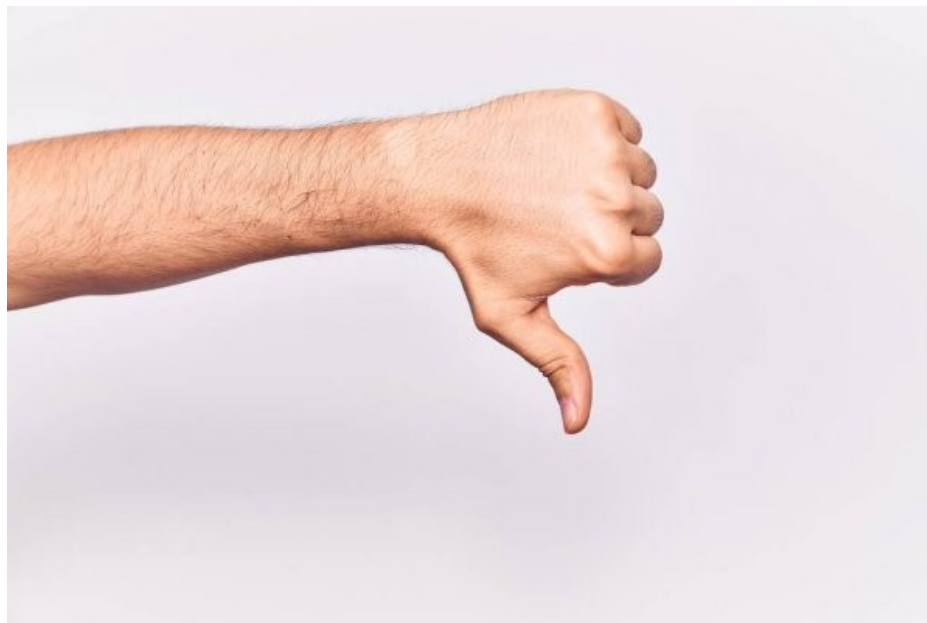
Key Points

Regular use of cold-water immersion decreases strength performance parameters (i.e., one-repetition maximum, maximal isometric strength, strength endurance, and ballistic effort performance).


Cold-water immersion does not affect aerobic exercise performance (i.e., time-trial performance and maximal aerobic power).

Studies involving the regular use of cold-water immersion present moderate methodological quality.

Jak ne?!



Exercise in children creates better behaviour in adults



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emma_fit_food This Japanese study which started in 2012 and was presented this year, looked at exercise in childhood and hypothesised that it may improve behaviour in adult life.

Inhibitory control refers to the ability to control attention, behaviour, thoughts and emotions in order to override impulsive reactions, irrelevant stimuli and external distractions.

This study found that childhood exercise was positively associated with response inhibition in later life however there are some limitations. By the end of the study there were only 214 self-reporting participants. It was a Japanese study & may not be replicated in Western societies and the study was conducted using a historical cohort design.

Although the findings were positive, taking into account these limitations, the researchers suggested an alternative explanation may be that individuals with better response inhibition engaged in exercise more regularly.

However, there are many other research papers linking exercise in childhood to a better adult life & especially with regards to balance and coordination. I find it worrying that schools continually

decrease opportunities in a bid to increase academic learning outcomes





Studies show that there is threefold increased risk of injury and multiple injury in taekwondo than karate

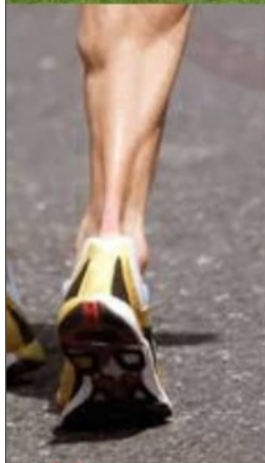


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In Elite Soccer Players

**A THICKER BASELINE
MID-TENDON THICKNESS
HAS BEEN DESCRIBED AS
A RISK INDICATOR FOR
THE DEVELOPMENT OF
ACHILLES
TENDINOPATHY**

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1 Thicker Achilles tendons are a risk factor to develop Achilles tendinopathy in elite professional soccer players

Jhingan, S; Perry, M; (...); Morrissey, D

Apr-jun 2011 | *MLTJ-MUSCLES LIGAMENTS AND TENDONS JOURNAL* 1 (2) , pp.51-56

The primary aim of this prospective cohort study was to compare the incidence of Achilles tendinopathy symptoms in elite soccer players with and without baseline asymptomatic ultrasound abnormalities. This study also investigated the relationship between baseline tendon thickness and development of symptoms. Using ultrasonography, 18 players were examined in 2009 for the existence of hypoechogenicity, paratenon blurring, foca ... [Show more](#)



32

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Thicker Achilles tendons are a risk factor to develop Achilles tendinopathy in elite professional soccer players

[Jhingan, Sachin](#); [Perry, Mark](#); (...); [Morrissey, Dylan](#)

Published 2011 | [MLTJ-MUSCLES LIGAMENTS AND TENDONS JOURNAL](#)

32

Times
Cited

Delicate $f(R)$ gravity models with a disappearing cosmological constant and observational constraints on the model parameters

~~[Dev, Abha](#), [Jain, Deepak](#), (...), [Thongkool, I.](#)~~

Published 2008 | [PHYSICAL REVIEW D](#)

81

Times
Cited

Phantom and non-phantom dark energy: The cosmological relevance of non-locally corrected gravity

~~[Jhingan, S.](#); [Nojiri, S.](#); (...); [Zerbini, S.](#)~~

Published 2008 | [PHYSICS LETTERS B](#)

110

Times
Cited

PRP



PRP in Sports is used to accelerate the healing of injured tendons, ligaments, muscles and joints

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sportsmeddr_official PRP is used to accelerate the healing of injured tissues in sports. PRP therapy is done by qualified doctors and has its own pros and cons. #plateletrichplasma #therapy #platelets #PRP #prptreatment #athletes #biological #treatment #sports #sportsscience #orthopaedics #sportsmedicine

44 týd.



9 To se mi líbí

6. KVĚTEN 2021



Přidejte komentář...

Zveřejnit

Platelet-rich plasma (PRP) to treat sports injuries: evidence to support its use

Elizaveta Kon · Giuseppe Filardo ·
Alessandro Di Martino · Maurilio Marcacci

Received: 23 July 2010 / Accepted: 12 October 2010 / Published online: 17 November 2010
© Springer-Verlag 2010

Abstract Tissue repair in musculoskeletal lesions is often a slow and sometimes incomplete process. In sports patients or professional athletes, the impact of musculoskeletal lesions on life and work is great, and the fast recovery of full efficiency and return to competition is of primary importance. The clinical improvement offered by available treatments is not always sufficient for highly demanding patients to return to their previous level of activity. The search for a minimally invasive solution to improve the status of the chondral surface of the injured joint is therefore highly desirable, especially in these patients. Platelet-rich plasma (PRP) is a procedure that

muscular injuries. The analysis of the literature shows promising preclinical results but contradictory clinical findings for the treatment of sport injuries. High-quality studies are required to confirm these preliminary results and provide scientific evidence to support its use.

Keywords Platelet-rich plasma · Sport · Musculoskeletal · Injury

Introduction



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Nordic hamstring exercise
is considered to be an
efficient way to prevent
hamstring injuries



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Effect of Injury Prevention Programs that Include the Nordic Hamstring Exercise on Hamstring Injury Rates in Soccer Players: A Systematic Review and Meta-Analysis

Wesam Saleh A. Al Attar^{1,2,3} · Najeebullah Soomro^{1,4} · Peter J. Sinclair¹ · Evangelos Pappas² · Ross H. Sanders¹

Published online: 17 October 2016
© Springer International Publishing Switzerland 2016

Abstract

Background Hamstring injuries are among the most common non-contact injuries in sports. The Nordic hamstring (NH) exercise has been shown to decrease risk by increasing eccentric hamstring strength.

Objective The purpose of this systematic review and meta-analysis was to investigate the effectiveness of the injury prevention programs that included the NH exercise on reducing hamstring injury rates while factoring in athlete workload.

Methods Two researchers independently searched for eligible studies using the following databases: the Cochrane Central Register of Controlled Trials via OvidSP, AMED (Allied and Complementary Medicine) via OvidSP, EMBASE, PubMed, MEDLINE, SPORTDiscus, Web of Science, CINAHL and AusSportMed, from inception to

December 2015. The keyword domains used during the search were Nordic, hamstring, injury prevention programs, sports and variations of these keywords. The initial search resulted in 3242 articles which were filtered to five articles that met the inclusion criteria. The main inclusion criteria were randomized controlled trials or interventional studies on use of an injury prevention program that included the NH exercise while the primary outcome was hamstring injury rate. Extracted data were subjected to meta-analysis using a random effects model.

Results The pooled results based on total injuries per 1000 h of exposure showed that programs that included the NH exercise had a statistically significant reduction in hamstring injury risk ratio [IRR] of 0.490 (95 % confidence interval [CI] 0.291–0.827, $p = 0.008$). Teams using injury prevention programs that included the NH exercise reduced hamstring injury rates up to 51 % in the long term compared with the teams that did not use any injury prevention measures.

Conclusions This systematic review and meta-analysis demonstrates that injury prevention programs that include NH exercises decrease the risk of hamstring injuries among soccer players. A protocol was registered in the International Prospective Register of Systematic Reviews, PROSPERO (CRD42015019912).

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¹ Discipline of Exercise and Sport Science, Faculty of Health

Including the Nordic hamstring exercise in injury prevention programmes halves the rate of hamstring injuries: a systematic review and meta-analysis of 8459 athletes

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¹Aspetar Injury and Illness Prevention Program (ASPREV), Aspetar Orthopaedic and Sports Medicine Hospital, Doha, Qatar
²Research Department, Aspetar Orthopaedic and Sports Medicine Hospital, Doha, Qatar
³Department of Rehabilitation, Aspetar Orthopaedic and Sports Medicine Hospital, Doha, Qatar

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Accepted 27 January 2019

ABSTRACT

Research question Does the Nordic hamstring exercise (NHE) prevent hamstring injuries when included as part of an injury prevention intervention?

Design Systematic review and meta-analysis.

Eligibility criteria for selecting studies We considered the population to be any athletes participating in any sporting activity, the intervention to be the NHE, the comparison to be usual training or other prevention programmes, which did not include the NHE, and the outcome to be the incidence or rate of hamstring injuries.

Analysis The effect of including the NHE in injury prevention programmes compared with controls on hamstring injuries was assessed in 15 studies that reported the incidence across different sports and age groups in both women and men.

Data sources MEDLINE via PubMed, CINAHL via Ebsco, and OpenGrey.

Results There is a reduction in the overall injury risk ratio of 0.49 (95% CI 0.32 to 0.74, $p=0.0008$) in favour of programmes including the NHE. Secondary analyses when pooling the eight randomised control studies demonstrated a small increase in the overall injury risk ratio 0.52 (95% CI 0.32 to 0.85, $p=0.0008$), still in favour of the NHE. Additionally, when studies with a high risk of bias were removed ($n=8$), there is an increase of 0.06 in the risk ratio to 0.55 (95% CI 0.34 to 0.89, $p=0.006$).

Conclusions Programmes that include the NHE reduce hamstring injuries by up to 51%. The NHE essentially halves the rate of hamstring injuries across multiple sports in different athletes.

Trial registration number PROSPERO
CRD42018106150.

one non-randomised) reduced injuries by approximately 70% by implementing the NHE in a team's training regime.^{9–11}

So why then do we need a systematic review of this type of intervention? Goode *et al*¹² performed a comprehensive systematic review but included just four studies, most likely due to selection criteria that only allowed for the inclusion of randomised control trials, and excluded articles not written in English. The most recent systematic review analysed the effectiveness of injury prevention programmes that included the NHE to reduce hamstring injuries in football while monitoring athlete workload.⁸ The results from the meta-analysis suggested that teams using the NHE (in isolation or as part of a larger injury prevention programme) reduced hamstring injury rates up to 51%. However, due to the exclusion of studies that did not provide workload data (training and match exposure) and sports other than football, this meta-analysis omits many studies that also included the NHE. The omission of relevant studies in both these previous reviews might lead to a biased estimation of the effect when including the NHE in an injury prevention programme. Further exclusion of studies that used an observational or cross-sectional design, multiple exposure groups, reporting compliance, and language, limits the generalisability of these findings. The basic clinical question is perhaps not best answered in this manner.

We, therefore, carried out an inclusive, comprehensive systematic review and meta-analysis on the effectiveness of injury prevention programmes that included the NHE in reducing the number of hamstring injuries.



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sportsmeddr_official As a Sports medicine doctor, you should travel to events and it takes you to amazing places. I had the pleasure to go to Kuttanad, the rice bowl of kerala with my team to cover a Triathlon Event. Sports medicine is not sitting behind a desk and seeing patients, it's about traveling to events, grounds and have immense passion for the sports. #sportsmedicine #Triathlon #cycling #swimming #running #kerala #kuttanad #sports

9 týd.



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9 týd. Odpovědět



32 To se mi líbí

10 LEDEN



Přidejte komentář...

Zveřejnit

Věda kolem nás

CTK ČESKÉ NOVINY

KORONAVIRUS: Zprávy Události kolem zavírání obchodů a služeb Přehled rozvolňovacích balíčků Foto z ČR Foto ze světa Web MZd

Lancet: Účinnost ruské vakcíny Sputnik V dosáhla 91,6 procenta

Aktualizace: 02.02.2021 16:04 Vydáno: 02.02.2021, 15:15



Ruská proticovidová vakcína Sputnik V - ilustrační foto, ČTK/AP/Pavel Golovkin [Koupit foto](#)

PRÁVĚ ZVEŘEJNĚNO

- Paliva v Česku v týdnu dál zdražila
- McDavid má 104 bodů, Colorado drží šanci na Prezidentův pohár
- Tesla přestane kvůli ekologii přijímat platby v bitcoinech
- Soud začne řešit nárok Rusa Nikulina na odškodnění za vydání do USA
- Bankovní asociace zveřejní nové odhady vývoje ekonomiky
- Sířeny zazněly i na severu Izraele, bombardování Dáma Gazu pokračuje

Lidé, kteří prodělali onemocnění covid-19, jsou až překvapivě dobře a dlouho chráněni před opakovanou infekcí.

Vyplývá to z velké analýzy, kterou v minulých týdnech udělal český vakcinolog Marek Petráš, přednosta Ústavu epidemiologie a biostatistiky 3. lékařské fakulty Univerzity Karlovy.

Vědec, jenž také vedl tým pracující na české vakcíně, porovnával výsledky celkem 15 světových studií, které byly na toto téma v posledních měsících publikovány. Šlo o odborné práce, jež zkoumaly četnost reinfekce u lidí, kteří covid-19 prodělali, respektive byli diagnostikováni jako pozitivní. Ať už šlo o lidi se symptomatickým onemocněním, či s bezpříznakovým průběhem.

Výsledky Petrášovy metaanalýzy by měl v nejbližší době publikovat americký odborný časopis JAMDA.

Aby vědci na otázku sezonního charakteru covidu-19 odpověděli, porovnal výskyt koronaviru mezi březnem 2020 a březnem 2021 v pěti zemích – Kanadě, Německu, Indii, Etiopii a Chile – s průměrnou denní teplotou, vlhkostí, ultrafialovým zářením a kapacitou vysoušení vzduchu (ADC). Výsledky studie byly publikovány v odborném časopise GeoHealth.

03. 06. 2018 | Zpět do přehledu novinek

Výsledky přelomové studie TAILORx, publikované v časopise The New England Journal of Medicine, ukázaly, že test Oncotype DX Breast Recurrence Score® jednoznačně identifikuje většinu žen s časným karcinomem prsu, které nemají prospěch z chemoterapie

Evaluace vědy kolem nás

Aby vědci na otázku sezonního charakteru covidu-19 odpověděli, porovnali výskyt koronaviru mezi březnem 2020 a březnem 2021 v pěti zemích – Kanadě, Německu, Indii, Etiopii a Chile – s průměrnou denní teplotou, vlhkostí, ultrafialovým zářením a kapacitou vysoušení vzduchu (ADC). Výsledky studie byly publikovány v odborném časopise [GeoHealth](#).

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4.73

JCR Category	Category Rank	Category Quartile
ENVIRONMENTAL SCIENCES <i>in SCIE edition</i>	83/274	Q2
PUBLIC, ENVIRONMENTAL & OCCUPATIONAL HEALTH <i>in SCIE edition</i>	41/203	Q1

Source: Journal Citation Reports™ 2020

ČTK ČESKÉ NOVINY

KORONAVIRUS: Zprávy Události kolem zavírání obchodů a služeb Přehled rozvojihovacích balíčků Foto z ČR Foto ze světa

Lancet: Účinnost ruské vakcíny Sputnik V dosáhla 91,6 procenta

Aktualizace: 02.02.2021 16:04 Vydané: 02.02.2021, 15:15



Ruská proticovidová vakcína Sputnik V - ilustrační foto. ČTK/AP/Pavel Gotovkin [Koupit foto](#)

PŘÁVĚ ZVEŘEJNĚNO

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- Sířeny zasněží i na severu Izraele, bombardování

LANCET

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2020

Five Year

79.323

77.237

JCR Category	Category Rank	Category Quartile
MEDICINE, GENERAL & INTERNAL <i>in SCIE edition</i>	2/167	Q1

Source: Journal Citation Reports™ 2020

Safety and efficacy of an rAd26 and rAd5 vector-based heterologous prime-boost COVID-19 vaccine: an interim analysis of a randomised controlled phase 3 trial in Russia



Denis Y Logunov*, Inna V Dolzhikova*, Dmitry V Shcheblyakov, Amir I Tukhvatulin, Olga V Zubkova, Alina S Dzharullaeva, Anna V Kovyrshina, Nadezhda L Lubenets, Daria M Grousova, Alina S Erokhova, Andrei G Botikov, Fatima M Izhaeva, Olga Popova, Tatiana A Ozharovskaya, Ilias B Esmagambetov, Irina A Favorskaya, Denis I Zrelkin, Daria V Voronina, Dmitry N Shcherbinin, Alexander S Semikhin, Yana V Simakova, Elizaveta A Tokarskaya, Daria A Egorova, Maksim M Shmarov, Natalia A Nikitenko, Vladimir A Gushchin, Elena A Smolyarchuk, Sergey K Zyrjanov, Sergei V Borisevich, Boris S Naroditsky, Alexander L Gintsburg, and the Gam-COVID-Vac Vaccine Trial Group†

Summary

Background A heterologous recombinant adenovirus (rAd)-based vaccine, Gam-COVID-Vac (Sputnik V), showed a good safety profile and induced strong humoral and cellular immune responses in participants in phase 1/2 clinical trials. Here, we report preliminary results on the efficacy and safety of Gam-COVID-Vac from the interim analysis of this phase 3 trial.

Methods We did a randomised, double-blind, placebo-controlled, phase 3 trial at 25 hospitals and polyclinics in Moscow, Russia. We included participants aged at least 18 years, with negative SARS-CoV-2 PCR and IgG and IgM tests, no infectious diseases in the 14 days before enrolment, and no other vaccinations in the 30 days before enrolment. Participants were randomly assigned (3:1) to receive vaccine or placebo, with stratification by age group. Investigators, participants, and all study staff were masked to group assignment. The vaccine was administered (0.5 mL/dose) intramuscularly in a prime-boost regimen: a 21-day interval between the first dose (rAd26) and the second dose (rAd5), both vectors carrying the gene for the full-length SARS-CoV-2 glycoprotein S. The primary outcome was the proportion of participants with PCR-confirmed COVID-19 from day 21 after receiving the first dose. All analyses excluded participants with protocol violations: the primary outcome was assessed in participants who had received two doses of vaccine or placebo, serious adverse events were assessed in all participants who had received at least one dose at the time of database lock, and rare adverse events were assessed in all participants who had received two doses and for whom all available data were verified in the case report form at the time of database lock. The trial is registered at ClinicalTrials.gov (NCT04530396).

Findings Between Sept 7 and Nov 24, 2020, 21977 adults were randomly assigned to the vaccine group (n=16 501) or the placebo group (n=5476). 19 866 received two doses of vaccine or placebo and were included in the primary outcome analysis. From 21 days after the first dose of vaccine (the day of dose 2), 16 (0.1%) of 14 964 participants in the vaccine group and 62 (1.3%) of 4902 in the placebo group were confirmed to have COVID-19; vaccine efficacy was 91.6% (95% CI 85.6–95.2). Most reported adverse events were grade 1 (7485 [94.0%] of 7966 total events). 45 (0.3%) of 16 427 participants in the vaccine group and 23 (0.4%) of 5435 participants in the placebo group had serious adverse events; none were considered associated with vaccination, with confirmation from the independent data monitoring committee. Four deaths were reported during the study (three [$<0.1\%$] of 16 427 participants in the vaccine group and one [$<0.1\%$] of 5435 participants in the placebo group), none of which were considered related to the vaccine.

Interpretation This interim analysis of the phase 3 trial of Gam-COVID-Vac showed 91.6% efficacy against COVID-19 and was well tolerated in a large cohort.

Funding Moscow City Health Department, Russian Direct Investment Fund, and Sberbank.

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This online publication has been corrected. The corrected version first appeared at the lancet.com on February 18, 2021

See Comment page 642

*Contributed equally

†Trial group members are listed in the appendix

Federal State Budget Institution "National Research Centre for Epidemiology and Microbiology named after Honorary Academician N F Gamaleya" of the Ministry of Health of the Russian Federation, Moscow, Russia (D Y Logunov DSc, I V Dolzhikova PhD, D V Shcheblyakov PhD, A I Tukhvatulin PhD, O V Zubkova PhD, A S Dzharullaeva MSc, A V Kovyrshina MSc, N L Lubenets MSc, D M Grousova MSc, A S Erokhova MSc, A G Botikov MSc, F M Izhaeva MSc, O Popova MSc, T A Ozharovskaya MSc, I B Esmagambetov PhD, I A Favorskaya PhD, D I Zrelkin MSc, D V Voronina MSc, D N Shcherbinin PhD, A S Semikhin PhD, Y V Simakova MSc, E A Tokarskaya PhD,

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