

2. LBP

Wedge shaped Vert

Wedge-shaped vertebrae is a risk factor for symptomatic upper lumbar disc herniation

Journal of Orthopaedic Surgery and Research — Wang F, et al. | August 27, 2019
Through a retrospective study of 65 patients with single-level upper lumbar disc her

niation (ULDH), who underwent surgery between January 2012 and December 2016, researchers examined the association between symptomatic ULDH and wedge-shaped vertebrae (WSV).

The incidence of WSV in the ULDH group was more in comparison with the lower lumbar disc herniation group. Statistically important variations in WSV, wedging angle of the vertebrae (WAV), and thoracolumbar kyphotic angle (TL), among the two groups, were found. On the basis of multivariate logistic regression analysis, WAV and TL were independently related to ULDH. The cutoff values of WAV and TL were 5.35° and 8.35° , which were significantly correlated with ULDH.

Hence, for ULDH, the WSV is an independent risk factor. The predictors for ULDH were WAV $> 5.35^\circ$ and TL $> 8.35^\circ$. It should be remarked that the patients with vertebral wedge deformation combined with thoracolumbar kyphosis have a greater risk of ULDH.

8. VISCERA

Peppermint oil helps IBS

Efficacy and safety of peppermint oil in a randomized double-blind trial of patients with irritable bowel syndrome

Gastroenterology — Weerts ZZRM, Masclee AAM, Witteman BJM, et al. | August 29, 2019

In patients with irritable bowel syndrome (IBS), researchers tested the safety and effectiveness of small intestinal-release peppermint oil and analyzed the impacts of targeted ileocolonic-release peppermint oil.

From August 2016 through March 2018, they performed a double-blind trial of 190 patients with IBS (according to Rome IV criteria) at four hospitals in the Netherlands. One hundred eighty-nine patients were involved in the intent to treat analysis (mean age was 34.0 years) and 178 completed the study.

Study participants were randomly assigned to groups given 182 mg small intestinal-release peppermint oil, 182 mg ileocolonic-release peppermint oil, or placebo for 8 weeks. In a randomized trial of IBS patients, the authors discovered that when using FDA/European Medicines Agency recommended endpoints, neither small-intestinal-release nor ileocolonic-release peppermint oil (8 weeks) yielded statistically significant decreases in abdominal pain response or overall symptom relief.

However, the small intestinal-release peppermint oil reduced abdominal pain, discomfort and severity of IBS significantly. Though mild, adverse events were more common in both peppermint oil groups.

Relationship between IBS and chronic pain

Pain Pract. 2019 Jul 18. doi: 10.1111/papr.12821.

Central Sensitization Inventory Mediates the Relationship Between Inflammatory Bowel Disease Activity and Worse Musculoskeletal Pain Experiences.

Falling CL¹, Stebbings S², Baxter DG¹, Geary RB³, Mani R¹.

BACKGROUND:

Musculoskeletal conditions are well documented in inflammatory bowel disease (IBD). However, whether IBD activity influences musculoskeletal pain experiences is uncertain. Central sensitization has been proposed in patients with IBD who are suffering from persistent pain. Identification of central sensitization symptomology using the Central Sensitization Inventory (CSI) has been reported in many pain-related disorders. Aims of this study were to explore predictive relationships between IBD activity and musculoskeletal pain experiences (severity/interference), and the mediating effects of the CSI.

METHODS:

A cross-sectional online survey was performed exploring self-reported musculoskeletal pain in adults with IBD. Survey questionnaires included IBD activity indices, numeric rating scales, PROMIS Pain Interference, and the CSI. Linear regression was used to examine the relationship between active IBD and pain experiences. Simple and serial mediation analyses were used to explore mediation models: independent variable (IBD activity), dependent variables (severity/interference), and mediators (CSI/severity).

RESULTS:

208 adults with IBD, 18 to 88 years of age, reported musculoskeletal pain. Regression analysis identified IBD activity as a significant predictor of worse pain severity ($R^2 = 0.039$, $P < 0.005$) and interference ($R^2 = 0.067$, $P < 0.001$). Simple mediation showed a significant indirect effect from CSI scores between IBD activity and pain severity. Serial mediation analysis showed a significant indirect effect from CSI scores and pain severity, between IBD activity and pain interference.

CONCLUSION:

Active IBD demonstrated a positive association with worse musculoskeletal pain experiences. The CSI demonstrated significant mediation between active IBD and pain severity. Additionally, the CSI and pain severity demonstrated significant mediation between active IBD and pain interference. This suggests that symptoms of central sensitization significantly influence musculoskeletal pain experiences in IBD.

7. PELVIC ORGANS/WOMAN'S HEALTH

Diastasis recti stiffness

J Orthop Sports Phys Ther. 2019 Mar 26;1-30. doi: 10.2519/jospt.2019.8543.

Differences in Linea Alba Stiffness and Linea Alba Distortion Between Women With and Without Diastasis Recti Abdominis: The Impact of Measurement Site and Task.

Beamish N¹, Green N², Nieuwold E², McLean L².

STUDY DESIGN:

Cross-sectional, observational cohort.

BACKGROUND:

The biomechanical implications of diastasis recti abdominis (DRA) are unknown.

OBJECTIVES:

(1) To investigate the impact of DRA, measurement site and task on inter-rectus distance (IRD), linea alba (LA) stiffness and LA distortion measured at rest, and during head lift and semi-curl-up tasks. (2) To describe the relationships among IRD, LA stiffness and LA distortion.

METHODS:

B-mode ultrasound imaging and shear-wave elastography were used on a sample of 20 women. IRD, LA stiffness and LA distortion were measured at three locations while women were at rest, and repeated head lift and semi-curl-up maneuvers. All outcomes were compared between groups (DRA/no DRA), sites and tasks. Linear regression models were used to evaluate the relationships among IRD, mean and peak LA stiffness and LA distortion.

RESULTS:

Eleven women with and nine without DRA participated. Women with DRA demonstrated lower peak and mean LA stiffness and higher LA distortion compared to women without DRA. In women with DRA, IRD and LA distortion were not influenced by measurement site; IRD decreased, LA distortion increased and LA stiffness did not change during the head lift and semi-curl-up compared to rest. In women without DRA, the LA was least stiff closest to the umbilicus; it increased in stiffness during the head lift and curl-up, and did not distort or change in IRD.

CONCLUSIONS:

DRA is associated with low LA stiffness and distortion during a semi-curl-up task; the amount of distortion is a function of both the IRD and LA stiffness. J Orthop Sports Phys Ther, Epub 26 Mar 2019. doi:10.2519/jospt.2019.8543.

10 A. CERVICAL SPINE

Not able to determine sensory motor deficits

J Orthop Sports Phys Ther. 2019 Aug 23;1-37. doi: 10.2519/jospt.2019.8846.

No Differences Between Individuals With Chronic Idiopathic Neck Pain and Asymptomatic Individuals on Seven Cervical Sensorimotor Control Tests: A Cross-Sectional Study.

de Zoete RMJ^{1,2}, Osmotherly PG^{1,3}, Rivett DA^{1,3}, Snodgrass SJ^{1,3}.

STUDY DESIGN:

Case-control study.

BACKGROUND:

Cervical sensorimotor outcomes have been suggested to be important in the assessment of individuals with neck pain. However, the large variety of sensorimotor control tests used in varying populations makes it difficult to draw conclusions about their clinical value.

OBJECTIVES:

To compare cervical sensorimotor control outcomes between individuals with chronic idiopathic neck pain and asymptomatic individuals using a battery of recommended tests, and to investigate the correlation between cervical sensorimotor control outcomes and pain intensity and neck disability.

METHODS:

Fifty participants with chronic idiopathic neck pain and 50 age and sex-matched asymptomatic controls completed seven cervical sensorimotor control tests: joint position error, joint position error torsion, postural balance, subjective visual vertical, head tilt response, The Fly, smooth pursuit neck torsion, and head steadiness. Between-group differences were investigated with Mann-Whitney U tests. Correlations between tests and levels of neck pain and disability were investigated using Spearman's rho.

RESULTS:

There were no differences in cervical sensorimotor outcomes between participants with chronic idiopathic neck pain and asymptomatic controls for any test (p-values ranged from p=0.203 to p=0.981). For each test, 'poor performers' consisted of both individuals with and without neck pain. Correlations were weak between tests and levels of neck pain (r values ranged from 0.010 to 0.294) and neck disability (0.007 to 0.316).

DISCUSSION:

These findings suggest sensorimotor control disturbances in individuals with chronic idiopathic neck pain may not be present, spawning debate on the clinical usefulness of these tests. *J Orthop Sports Phys Ther*, Epub 23 Aug 2019. doi:10.2519/jospt.2019.8846.

3 C. AIRWAYS/SWALLOWING/SPEECH

Menopause and reduced lung function

Eur Respir J. 2019 Aug 22. pii: 1802421. doi: 10.1183/13993003.02421-2018

Age at menopause and lung function: a Mendelian Randomization study.

van der Plaats DA^{1,2,3}, Pereira M³, Pesce G^{4,2}, Potts JF³, Amaral AFS³, Dharmage SC⁵, Garcia-Aymerich JM^{6,7,8}, Thompson JR⁹, Gómez-Real F^{10,11}, Jarvis DL³, Minelli C³, Leynaert B^{4,2}; ALEC project.

in observational studies, early menopause is associated with lower FVC and a higher risk of spirometric restriction, but not airflow obstruction. It is however unclear if this association is causal. We therefore used a Mendelian randomisation (MR) approach, which is not affected by classical confounding, to assess the effect of age at natural menopause on lung function. We included 94 742 naturally post-menopausal women from UK Biobank and performed MR analyses on the effect of age at menopause on FEV₁, FVC, FEV₁/FVC, spirometric restriction (FVC<LLN) and airflow obstruction (FEV₁/FVC<LLN). We used the inverse variance-weighted (IVW) method, as well as methods that adjust for pleiotropy, and compared MR with observational analyses. The MR analyses showed higher FEV₁/FVC and a 15% lower risk of airflow obstruction for women with early (<45 years) compared to normal (45-55) menopause. Despite some evidence of pleiotropy, the results were consistent when using MR methods robust to pleiotropy. Similar results were found among never- and ever-smokers, while the protective effect seemed less strong in women ever using menopause hormone treatment and in overweight women. There was no strong evidence of association with FVC or spirometric restriction. In observational analyses of the same dataset, early menopause was associated with a pronounced reduction in FVC and a 13% higher spirometric restriction risk

.Our MR results suggest that early menopause has a protective effect on airflow obstruction. Further studies are warranted to better understand the inconsistency with observational findings, and to investigate the underlying mechanisms and role of female sex hormones.

13 D. SLEEP**Obesity**

Eur Neurol. 2019;81(3-4):190-196. doi: 10.1159/000502003. Epub 2019 Jul 23.

Which Factors Are the Most Important for Predicting Sleep Quality in Obstructive Sleep Apnea Patients with Obesity?

Kim BJ¹, Park KM².

BACKGROUND:

Both obstructive sleep apnea (OSA) and obesity are associated with poor sleep quality. However, there have been no studies investigating sleep quality in OSA patients with obesity. The aims of this study were to (1) evaluate the sleep quality in OSA patients with obesity and (2) identify the parameters most related to sleep quality in OSA patients with obesity.

METHODS:

Of the patients with polysomnography (PSG), OSA patients with obesity (body mass index [BMI] ≥ 25) were enrolled and then divided into 2 groups based on the Pittsburgh Sleep Questionnaire Index (PSQI): patients with good sleep quality (PSQI ≤ 5 , good sleepers) and those with poor sleep quality (PSQI > 5 , poor sleepers). In addition, we enrolled OSA patients without obesity as a disease control group.

RESULTS:

Eighty-two OSA patients with obesity met the inclusion criteria (28 were good sleepers, whereas 54 were poor sleepers). We found that the BMI of the poor sleepers was significantly higher than that of the good sleepers, whereas the N-stage sleep ratio of good sleepers was higher than that of poor sleepers. Logistic regression analysis also showed that a high BMI and low N-stage sleep ratio were independently associated with poor sleep quality. In addition, BMI and N-stage sleep ratio were significantly correlated with PSQI. However, in 56 OSA patients (n = 56) without obesity, there were no differences of demographic/clinical characteristics and PSG parameters between the good (n = 18) and poor sleepers (n = 38).

DISCUSSIONS:

About two-thirds of OSA patients with obesity show poor sleep quality. The sleep quality of these patients was more affected by the severity of obesity, but not the severity of OSA. Thus, we recommend weight loss in OSA patients with obesity to improve sleep quality as well as the severity of OSA.

14. HEADACHES

Diet and HA

Comparison of Diet Quality Between Women With Chronic and Episodic Migraine

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Reza Mahdavi PhD Maryam Behrouz PhD

<https://doi.org/10.1111/head.13623>

Background/Objectives

Different triggers including environmental, hormonal, and dietary factors have been introduced as migraine risk factors. There is some evidence to suggest that a high quality of diet could be effective regarding management of migraine. In this present study, we hypothesized that the diet quality of women with chronic migraine (CM) might be different from women with episodic migraine (EM).

Methods

In this cross-sectional study, 116 women with chronic and 169 women with episodic migraine (25-55 years old) were recruited from the neurology clinics of Golestan hospital in Ahvaz (southwest Iran) based on the International Classification of Headache Disorders-III. Anthropometric data including weight, height, waist, and hip circumference were measured. Dietary intake data were obtained using a reliable and valid semi-quantitative food frequency questionnaire that included 168 food items. The diet quality of subjects was calculated using the Healthy Eating Index-2015 (HEI-2015).

Results

The mean HEI score of participants was 57.29 ± 7.98 . The participants were classified into 3 groups of “poor,” “needs improvement,” and “good” based on their diet quality. The frequencies of each group were 50/285 (17.5%), 233/285 (81.8%), and 2/285 (0.7%), respectively. Moreover, the mean of HEI score in women with CM was significantly lower than women with EM (55.93 ± 7.90 vs 58.93 ± 7.93 , $P = .02$). Moreover, there was a significant negative association between CM and HEI score of women ($\beta = -2.03$; 95% CI: $[-3.97$ to $-0.10]$; $P = .04$).

Conclusions

Women with CM had a lower diet quality than that of EM. Moreover, CM was significantly and inversely associated with HEI score in women.

28. HIP REPLACEMENTS

Anterior approach reduces revisions

BMC Musculoskelet Disord. 2019 Aug 22;20(1):385. doi: 10.1186/s12891-019-2765-z.

The risk of revision after total hip arthroplasty in young patients depends on surgical approach, femoral head size and bearing type; an analysis of 19,682 operations in the Dutch arthroplasty register.

Kuijpers MFL¹, Hannink G², Vehmeijer SBW³, van Steenberg LN⁴, Schreurs BW⁵.

BACKGROUND:

Total hip arthroplasty (THA) is used increasingly in younger patients. There is little knowledge about the effect of THA characteristics on risk of revision, especially in young patients. Therefore, we studied the influence of both patient-related and surgical factors on the risk of revision using data from the Dutch Arthroplasty Registry (LROI).

METHODS:

All patients younger than 55 years with a primary THA implanted in the Netherlands between 2007 and 2017 were selected (n = 19,682). The covariates age, sex, primary diagnosis, ASA-classification, surgical approach, fixation method, bearing type, head size and year of surgery were entered into Cox proportional hazards models to calculate hazard ratios for the risk of revision.

RESULTS:

The overall 5-year survival of primary THA was 95.3% (95% CI, 94.9-95.6). Use of the anterior approach resulted in a lower risk of revision than the use of the posterolateral approach (HR: 0.66, 95% CI: 0.47-0.92). THAs with a head diameter ≥ 38 mm had a higher risk of revision (HR: 1.90, 95% CI: 1.33-2.72) than THAs with 32 mm heads. Use of MoM bearings resulted in an increased risk when compared to C-PE (HR: 1.76, 95% CI: 1.27-2.43).

CONCLUSION:

The risk of revision in patients younger than 55 years depends on surgical approach, head size and bearing type. The anterior approach resulted in a decreased risk of revision, whereas use of ≥ 38 mm heads and MoM bearings resulted in an increased risk of revision for any reason.

34. PATELLA

Management of PF pain

J Orthop Sports Phys Ther. 2019 Jul 10:1-25. doi: 10.2519/jospt.2019.8889.

Association Between Self-Reported Measures, Physical Examination and Early Magnetic Resonance Imaging Signs of Osteoarthritis in Patients With Patellofemoral Pain.

Eijkenboom JFA¹, Timmer ER¹, van der Heijden RA², de Kanter JML², Oei EHG², Bierma-Zeinstra SMA¹, van Middelkoop M¹.

STUDY DESIGN:

Cross-sectional.

BACKGROUND:

Structural abnormalities associated with osteoarthritis (OA) are found in some patients with patellofemoral pain (PFP).

OBJECTIVES:

Investigate the association between early signs of OA on MRI and characteristics from self-reported measures and physical examination in patients with PFP.

METHODS:

Data of patients with PFP from a cross-sectional case-control study were used (N=64, 55% female, mean age 23.4(7.0)). Structural OA features (osteophytes, bone marrow lesions, cartilage defects, Hoffa synovitis, patellar tendon abnormalities) and quantitative T2 measurements of cartilage composition were extracted from MRI. Associations between characteristics from self-reported measures (pain in rest, pain during stair walking, knee function, duration of complaints, hours of sports participation), physical examination (crepitus, quadriceps strength) and early MRI signs of OA were analyzed.

RESULTS:

Symptom duration was associated with bone marrow lesions in the patella (OR 1.10; 95% CI [1.00-1.21]). Hours of sports participation per week was inversely associated with patellar tendon abnormalities on MRI (OR 0.75; 95% CI [0.59-0.97]). Crepitus and bilateral nature of the complaints were associated with small cartilage defects in the patellar cartilage (OR 11.95; 95% CI [2.25-63.61] and 7.62; 95% CI [1.08-53.75] respectively). No significant associations were found between clinical characteristics and cartilage T2 relaxation time.

CONCLUSION:

Presence of crepitus, bilateral complaints, a long PFP symptom duration and reduced sport participation per week seem to be associated with early signs of OA in a young PFP population, which may represent a distinct subgroup of patients with PFP who have a high risk to develop PFOA.

35. KNEE/TOTAL**Patella resurfacing helps**

J Arthroplasty. 2019 Sep;34(9):1969-1974. doi: 10.1016/j.arth.2019.04.050. Epub 2019 May 2.

Resurfacing in a Posterior-Stabilized Total Knee Arthroplasty Reduces Patellar Crepitus Complication: A Randomized, Controlled Trial.

Thiengwittayaporn S¹, Srungboonmee K², Chiamtrakool B¹.

BACKGROUND:

Patellar crepitus (PC) is a common complication after total knee arthroplasty (TKA) using a posterior-stabilized (PS) prosthesis. While numerous factors have been associated with PC development after PS-TKA, patellar resurfacing (PR) which directly impacts the patellofemoral joint kinematics has been underinvestigated. A prospective, randomized, controlled trial was conducted to (1) compare the PC incidence in PR and non-PR PS-TKA, (2) determine the time of PC presentation in PS-TKA, (3) identify radiographic parameters associated with PC, and (4) compare clinical outcomes of patients with and without PR.

METHODS:

A total of 84 patients who underwent unilateral TKA using the Legion PS Total Knee System were randomized into PR group or non-PR group. PC incidence, time of PC presentation, radiographic parameters associated with PC development, and clinical outcomes were evaluated at 3 months, 6 months, 9 months, and 1 year postoperatively.

RESULTS:

PC occurred significantly more in the non-PR group (23.1% vs 7.3%, $P = .048$). Time of PC presentation in both groups was not different. Anterior knee pain was found in 16.7% of crepitus patients, and none required any surgical procedure. The non-PR knees had significant decreases in patellar shift index, patellar displacement, Insall-Salvati ratio, and patellar component height and increase in change in posterior femoral offset. Oxford and patellar scores were significantly better in the PR group at 9 months and 1 year.

CONCLUSION:

Given higher PC incidence and several worse clinical outcomes in the non-PR, we recommend resurfacing during PS-TKA with this knee system to avoid PC development.

36. KNEE/EXERCISE

37. OSTEOARTHRITIS/KNEE

38 A. FOOT AND ANKLE

38 B. FOOT TYPES

38 C. FOOT

39 B. SHOES

40. ANKLE SPRAINS AND INSTABILITY

41 A. ACHILLES TENDON AND CALF

41 B. COMPARTMENT SYNDROME

42. PLANTAR SURFACE

Pressure pain sensitivity

J Orthop Sports Phys Ther. 2019 Mar 26:1-26. doi: 10.2519/jospt.2019.8813

Topographical Pressure Pain Sensitivity Maps of the Feet Reveal Bilateral Pain Sensitivity in Patients With Unilateral Plantar Heel Pain.

Ríos-León M¹, Ortega-Santiago R^{2,3}, Madeleine P⁴, Fernández-de-Las-Peñas C^{2,3}, Plaza-Manzano G^{5,6}.

BACKGROUND:

Plantar heel pain is one of the most common foot pain conditions treated by healthcare providers.

OBJECTIVE:

To investigate differences in topographical pressure pain sensitivity maps of the feet between patients with unilateral plantar heel pain and healthy subjects and to determine the relationship between topographical pressure maps, pain intensity, disability and fascia thickness.

METHODS:

Thirty-five patients with unilateral plantar heel pain and 35 matched healthy controls participated. Pressure pain thresholds (PPT) were assessed over 7 plantar locations on each foot. Topographical pressure pain sensitivity maps of the plantar region were generated using the averaged PPT of each assessed point. Pain and related-disability were assessed with a numerical pain rate scale (0-10) and the Foot and Ankle Ability Measure (FAAM), respectively. Plantar fascia thickness was measured via ultrasound. All outcomes were obtained by an assessor blinded to the subjects' condition.

RESULTS:

Topographical pressure sensitivity maps revealed lower bilateral PPTs in patients with plantar heel pain as compared to healthy controls, and higher PPT on the calcaneus bone ($P < 0.01$). Females showed lower PPTs than men in all areas ($P < 0.001$). Individuals with plantar heel pain also exhibited an increase of fascia thickness, but only on the affected side, compared to healthy controls. Higher pressure pain sensitivity in the foot was associated with higher pain intensity at first step in the morning and a higher fascia thickness at the calcaneus bone.

CONCLUSIONS:

Topographical pressure sensitivity maps revealed that individuals with unilateral plantar heel pain exhibited generalized bilateral pressure pain sensitivity in the plantar region. Higher pain intensity and fascia thickness were associated with higher pressure pain sensitivity in individuals with plantar heel pain. Our findings can be used for improving ergonomic interventions, e.g., foot orthoses, in individuals with plantar heel pain.

LEVEL OF EVIDENCE:

Case-control study, Level 4. J Orthop Sports Phys Ther, Epub 26 Mar 2019.
doi:10.2519/jospt.2019.8801.

43. HALLUX VALGUS

44. RHUMATOID ARTHRITIS

45 A. MANUAL THERAPY LUMBAR & GENERAL

45 B. MANUAL THERAPY CERVICAL

45 C. MANUAL THERAPY THORACIC

45 D. MANUAL THERAPY EXTREMITIES

46 A. UPPER LIMB NEUROMOBILIZATION

46 B. LOWER LIMB NEUROMOBILIZATION

47. STRETCHING/MUSCLES

48 A. STM

48 B. TRIGGER POINTS NEEDLING

48 B ACUPUNCTURE

**48 C. MUSCLES 49. STRETCHING 50 A. MOTOR CONTROL 50 B. PNF 51. CFS/BET
52. EXERCISE 53. CORE**

54. POSTURE

55. SCOLIOSIS

56. ATHLETICS

Soccer on injury

Sports Medicine pp 1–21| Cite as

Injury Incidence, Prevalence and Severity in High-Level Male Youth Football: A Systematic Review

- Steven Jones Sania Almousa Alistair Gibb Nick Allamby Rich Mullen hor Einar Andersen

- Morgan Williams
- **Background**

At a young age, high-level youth footballers enter structured practice where they engage in regular training and matches. The academy system is considered fundamental to a young footballer's tactical, technical and physical development. Yet, with regular training and matches, high-level youth footballers may be exposed to the risk of injury.

Objective

This systematic review analyses and summarises published scientific information on high-level youth football injury characteristics and calculates the risk of them sustaining an injury over the course of a typical season.

Methods

The search was performed using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Of the 1346 studies found, 23 fulfilled the inclusion criteria.

Results

Quality assurance scores for the selected research articles ranged between two and five out of eight. A high degree of heterogeneity between studies was observed. The probability of sustaining a time-loss injury during a high-level youth season ranged between < 1% and 96% for under 9- to under 16-year age groups and 50% and 91% for under 18- to under 21-year age groups. Pooled estimates for total (training and match) incidence per 1000 h was 5.8 for youth players aged under 9 to under 21 years, 7.9 for older players (under 17–under 21 years) and 3.7 for younger aged players (under 9–under 16 years). Training injury incidence rate ranged from 0.69 to 7.9 per 1000 h for all age groups in youth football. Match injury incidence rate for high-level youth players ranged from 0.4 to 80.0 per 1000 h. Close to one-fifth (18%) of all high-level youth football injuries were classified as severe and required > 28 days recovery time. Muscle strain injury accounted for 37% of all injuries reported in youth football. High probabilities (> 90%) of sustaining a time-loss injury over one typical high-level football season were found.

Conclusion

High-level youth players lose large portions of the seasonal development to injury, with players seemingly suffering long absences from training and matches, consequently affecting health and well-being and possibly burdening club/parental finances and healthcare systems.