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POVREDE USLED PRENAPREZANJA KOD MLADIH SPORTISTA

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SAŽETAK: UVOD. Kod povreda usled prenaprezanja ne postoji jasan pojedinačni događaj koji se može povezati sa povredom. Smatra se da nastaju kao posledica ponavljano submaksimalnog opterećenja muskuloskeletnog sistema koje nije praćeno adekvatnim odmorom. Cilj istraživanja je utvrditi učestalost povreda usled prenaprezanja kod mladih sportista, njihovu polnu strukturu i anatomsku lokalizaciju, kao i njihov uticaj na nivo treninga i takmičenja u prethodnoj sezoni. MATERIJAL I METODE. Istraživanje je zasnovano na analizi upitnika koji su popunjavali sportisti na kraju sezone 2018/2019. Korišćen je upitnik Oslo Sports Trauma Research Center Overuse Injury Questioner preveden na srpski jezik i modifikovan tako da se odnosi na prethodnu sezonu. Ukupno je učestvovao 171 sportista, od čega su 99 (58,1%) bili muškarci i 72 (41,9%) žene. U istraživanju su učestvovali sportisti uzrasta od 15 do 30 godina koji su se takmičili u 5 sportskih disciplina: košarka, fudbal, odbojka, rukomet i karate. REZULTATI. Od ukupno 171 sportiste koji su učestvovali u ispitivanju kod njih 48,5% registrovana je najmanje jedna iz grupe povreda usled prenaprezanja. Kod sportista muškog pola, od ukupno njih 99, povrede su registrovane kod 44,4%. Kod žena su registrovane kod 54,8% od ukupno 72. Prema anatomskoj lokalizaciji, kod muškaraca povrede kolena su registrovane kod 40,9%, povrede leđa kod 31,8%, iste na više anatomskih lokalizacija kod 15,9% i ramena kod 11,4%. Kod žena povrede kolena su registrovane kod 47,1%, ramena kod 23%, leđa 17,6% i više lokalizacija 11,8%. Kod muškaraca koji su prijavili povredu kolena njih 61,1% imalo je puno učešće u sportskim aktivnostima ali sa problemima sa kolenom i smanjenjem obima treninga. Nešto više od polovine je izjavilo da povrede nisu uticale na učinak tokom prošle sezone i prijavilo je blag bol u kolenu. Ispitanice, veći deo njih, prijavile su puno učešće bez problema sa kolenom i nisu smanjile obim treninga kao i da problemi sa kolenom nisu uticali na učinak. Najveći procenat je prijavio blagi bol. Kod muških ispitanika kod kojih je registrovana povreda u donjem delu leđa najveći procenat 64,3% su prijavila puno učešće u sportskim aktivnostima ali sa problemima, polovina je smanjila obim treninga. U najvećem procentu 64,4% nisu uticali na učinak u toku prethodne sezone, a svi ispitanici su prijavili blag bol. Sve ispitanice su odgovorile da su imale puno učešće, ali sa problemima u donjem delu leđa. Najveći broj 71,4% je u manjoj meri smanjio obim treninga, dok je 42,8% odgovorilo da je problem u donjem delu leđa nije uticao na učinak u toku prethodne sezone i sve su prijavile blag bol. Na pitanja u vezi sa problemom sa ramenom najveći broj muških ispitanika, njih 60%, odgovorilo je da je imalo smanjeno učešće zbog problema sa ramenom. Jednak procenat (40%) je prijavio da je u manjoj meri smanjio obim treninga. Više je od polovine (60%) prijavilo da je problem sa ramenom uticao na učinak, a svi ispitanici su prijavili neki nivo bola u ramenu. Takođe, i najveći broj ženskih ispitanika, njih 77,8%, prijavilo je puno učešće ali sa problemima sa ramenom, da je smanjilo obim treninga i da su uticali na učinak u toku prošle sezone. Najveći procenat je prijavio neki nivo bola. ZAKLJUČAK. Našim istraživanjem neka od povreda usled prenaprezanja registrovana je kod gotovo polovine ispitanika, 48,5%. Povrede su češće registrovane kod osoba ženskog pola. Kod obe grupe ispitanika koleno je bilo najčešća anatomska lokalizacija

Ključne reči: sportsko prenaprezanje, sportske povrede, mladi sportisti

UVOD

Učešće mladih u sportu i redovno bavljenje fizičkom aktivnošću nudi brojne benefite: poboljšanje opšteg zdravstvenog stanja, socijalizacija sa vršnjacima, porast samopouzdanja. Redovna fizička aktivnost i bavljenje sportom je široko promovisana zbog brojnih pozitivnih efekata. Doprinosi

poboljšanju funkcije kardiovaskularnog sistema, pozitivno utiče na razvoj nervnog i mišićnog sistema, smanjuje anksioznost. Iako decu i mlade treba ohrabrivati da učestvuju u više različitim sportskim aktivnostima i razvijaju različite veštine, danas je sve češći slučaj da mladi sportisti učestvuju u samo jednom sportu i vrši se takozvana „rana specijalizacija“ u sportu, koja se

često završi pre kraja osnovne škole. Mladi, kao i njihovi roditelji, iz želje za učešćem u elitnim ligama, dobijanju stipendije i slično te sve ranije počinju sa treninzima velikog intenziteta. Sve to dovodi do sve češćih povreda u sportu. Veliki broj učesnika u sportskim aktivnostima doveo je do toga da je sport primarni uzrok povreda kod mladih. Danas se povrede u sportu najčešće dele na akutne (traumatske) i povrede usled prenaprezanja. Traumatske povrede su rezultat specifičnog događaja, koji se može identifikovati. Kod prenaprezanja ne postoji jasan pojedinačni

događaj koji se može povezati sa povredom. Smatra se da ove povrede nastaju kao posledica ponavlanog submaksimalnog opterećenja muskuloskeletnog sistema koje nije praćeno adekvatnim odmorom. Radi se o ponavljanim mikrotraumama nastalim kao posledica ponavlanog izlaganja sili ili velikom broju ponavljanja. U većini slučajeva tkivo se na početku procesa oporavlja bez vidljivih znakova i simptoma, ipak kako se proces nastavlja, mogućnost adaptacije se iscrpljuje i rezultira klinički jasnim simptomima (grafikon 1.).

GRAFIKON 1. VREMENSKI SLED DOGAĐAJA U SPORTSKOM TRENINGU. Hipotetički pregled početka povrede tkiva i boli kod tipične povrede usled prenaprezanja u sportu. (Preuzeto od R. Bahra. Bez povrede, ali jako boli? O metodologiji za evidentiranje simptoma povrede usled prenaprezanja u sportu. Br J Sports Med 2009;43:966–972. doi:10.1136/bjsm.2009.066936)

Smatra se da su povrede usled prenaprezanja jedan od najčešćih etioloških faktora koji dovodi do povreda kod mladih sportista i da gotovo polovina sportskih povreda kod dece i mladih pripada ovim povredama. Povrede usled prenaprezanja mogu zahvatiti: kosti, mišiće, tetive, ligamente. Postoji više faktora rizika za nastanak ovih povreda kao što su: prethodna povreda, adolescentni uzrast, viši intenzitet treninga itd. Smatra se da su ove povrede potcenjene u literaturi jer najveći broj studija definiše povrede na osnovu vremena odsustvovanja sa takmičenja. Tek se novijim ispitivanjima navodi termin "prisustvo bilo koje fizičke tegobe", a pre svega bola, što je dovelo do znatno većeg broja prijavljenih povreda usled prenaprezanja. Međutim postoje i radovi koji ukazuju na prečesto korišćenje termina povrede usled prenaprezanja i savetuju da ga treba izbegavati sve dok nema definitivnih dokaza o

uzroku povrede. Najčešće ove povrede zahvataju koleno, rame i donji deo leđa. Sve više je prepoznat značaj redovnog praćenja i zaštite zdravstvenog stanja sportista. Iz tog razloga razvijeno je više sistema za prijavljivanje i praćenje bolesti i povreda kod sportista. Od 2008. godine Međunarodni olimpijski komitet je razvio sistem za praćenje povreda. Prve zvanične smernice odnosile su se na prijavljivanje i praćenje povreda u fudbalu, a nešto kasnije su one predstavljale osnov za druge sportove. Danas se sve češće koristi upitnik razvijen 2013. godine za registrovanje povreda usled prenaprezanja. Oslo Sports Trauma Research Centre Overuse Injury Questioner ima 4 ključna pitanja i sistem odgovora i bodovanja. Upitnik prikuplja podatke na osnovu toga da li su sportisti doživeli/osetili bol, imali ograničeno učešće na treningu ili

takmičenju i smanjen obim treninga ili takmičenja.

CILJ

Cilj istraživanja je utvrditi učestalost povreda usled prenaprezanja kod mladih sportista, njihovu polnu strukturu i anatomsku lokalizaciju, kao i njihov uticaj na nivo treninga i takmičenja u prethodnoj sezoni.

MATERIAL I METODE

Istraživanje je zasnovano na analizi upitnika koji su popunjavali sportisti na kraju sezone 2018/2019. U istraživanju je učestvovao 171 sportista, uzrasta 15 do 30 godina. Ispitivani sportisti takmičili su se u 5 sportskih disciplina: košarka, fudbal, rukomet, odbojka i karate. Korišćen je upitnik Oslo Sports Trauma Research Center Overuse Injury Questioner preveden na srpski jezik i modifikovan tako da se odnosi na prethodnu sezonu.

REZULTATI

Ukupno je učestvovalo 171 sportista, od čega su 99 (58,1%) bili muškarci i 72 (41,9%) žene. U istraživanju su učestvovali sportisti uzrasta 15 do 30 godina koji su se takmičili u 5 sportskih disciplina: košarka, fudbal, odbojka, rukomet i karate. Najviše sportista bilo je uzrasta 15 godina 29,7% (51) i 16 godina 18,8% (32), zatim 18 godina 10,8% (19), dok je ostalih uzrasta bilo od 1,3% do 5,4%. Od ukupno 171 sportiste koji su učestvovali u ispitivanju kod njih 48,5% (83) registrovana je najmanje jedna iz grupe povreda usled prenaprezanja. Kod sportista muškog pola, od ukupno njih 99, povrede usled prenaprezanja su registrovane kod 44,4% (44). Kod žena su registrovane kod 54,8% (39) od ukupno 72. Prema anatomskoj lokalizaciji, kod muškaraca, povrede kolena su registrovane kod 40,9% (18), povrede leđa kod 31,8% (14), povrede na više anatomskih lokalizacija kod 15,9% (7) i povrede ramena kod

11,4% (5). Kod žena povrede kolena su registrovane kod 47,% (18), iste ramena kod 23% (9), leđa 17,6% (7) i više lokalizacija 11,8% (5). Kod muškaraca koji su prijavili povredu kolena njih 61,1% (11) je prijavilo da je imalo puno učešće u sportskim aktivnostima ali sa problemima sa kolenom, 27,8% (5) puno učešće bez problema sa kolenom, 11,1% (2) smanjeno učešće zbog problema sa kolenom a niko nije prijavio da nije mogao učestvovati. Njih 72,2% (13) nije smanjilo obim treninga zbog problema sa kolenom, 11,1% (2) je prijavilo da je u manjoj meri smanjilo obim treninga zbog problema sa kolenom, 11,1% (2) umereno smanjilo, 5,6% (1) u većoj meri smanjilo. Na pitanje u kojoj meri su problemi sa kolenom uticali na sportski učinak tokom prošle sezone: 55,5% (10) je odgovorilo da nisu uticali, 16,7% (3) je odgovorilo u manjoj meri, 5,6% (1) je odgovorilo da su umereno uticali dok je 22,2% (4) odgovorilo da su uglavnom uticali. Blagi bol u kolenu vezan za sport prijavilo je 55,5% (10), 33,4% (6) je prijavilo umereni bol a 11,1% (2) je prijavilo jak bol. Kod žena njih 55,5% (10) je prijavilo puno učešće u sportu bez problema sa kolenom, 44,5% (8) puno učešće ali sa problemima sa kolenom, dok nije bilo prijavljenih slučajeva smanjenog učešća. Ukupno 83,3% (15) nije smanjilo obim treninga, 16,7% (3) ispitanica smanjenje obim treninga manjoj meri, niko nije prijavio veći obim smanjenja. Ukupno 61,1% (11) je prijavilo da problemi sa kolenom nisu uticali na učinak u toku prošle sezone dok je 38,9% (7) prijavilo da su u manjoj meri uticali na učinak, nije bilo odgovora da su umereno ili uglavnom uticali. Njih 22,2% (4) nije prijavilo bol u kolenu, 38,9% (7) je prijavilo da su doživele blagi bol, 27,8% (5) umereni bol i 11,1% (2) jak bol u kolenu vezan za sport. (Tabela 1.)

Tabela 1. Uticaj povreda usled prenaprezanja u predelu kolena na sportske aktivnosti prema polnoj strukturi

Odgovor	Da li ste imali problema sa učešćem u treningu ili takmičenju zbog problema sa kolenom u toku prošle sezone?				U kojoj meri ste smanjili obim učešća u treningu zbog problema sa kolenom u toku prošle sezone?				
	Puno učešće bez problema sa kolenom	Smanjeno učešće zbog problema sa kolenom	Puno učešće ali sa problemima sa kolenom	Nisam mogao učestvovati zbog problema sa kolenom	Nema smanjenja	U manjoj meri	Umereno	Uglavnom	Nisam mogao uopšte učestvovati
Muškarci	27.8%	11,1%	61.1%	0%	72.2%	11.1%	11.1%	5.6%	0%
Žene	55.6%	0%	44.4%	0%	83.3%	16.7%	0%	0%	0%

	U kojoj meri su problemi sa kolonom uticali na Vaš učinak u toku prošle sezone?					Do kog ste nivoa prošle sezone doživeli bol u kolenu vezan za Vaš sport?			
Odgovor	Nisu uticali	U manjoj meri su uticali	Umereno su uticali	Uglavnom su uticali	Nisam mogao uopšte učestvovati	Nema bola	Blagi bol	Umereni bol	Jak bol
Muškarci	55.5%	16.7%	5.6%	22.2%	0%	0%	55.5%	33.4%	11.1%
Žene	61.1%	38.9%	0%	0%	0%	22.2%	38.9%	27.8%	11.1%

Kod muškaraca kod kojih je registrovana povreda u donjem delu leđa: 35,7% (5) je prijavilo puno učešće u treningu ili takmičenju bez problema u donjem delu leđa, 64,3% (9) puno učešće ali sa problemima u donjem delu leđa, dok smanjeno učešće nije prijavljeno. Njih 50% (7) nije smanjilo obim treninga zbog problema u donjem delu leđa a 50% (7) je u manjoj meri smanjilo. Ispitanici su u 64,4% (9) odgovorili da problemi u donjem delu leđa nisu uticali na učinak tokom prošle sezone, 35,7% (5) je odgovorilo da su manjoj meri uticali dok nije bilo odgovora da su u većoj meri uticali. Svi

ispitanici koji su imali problem u donjem delu leđa su prijavili blagi bol. Kod žena sve ispitanice su odgovorile da su imale puno učešće u treningu ili takmičenju ali sa problemima u donjem delu leđa. Njih 14,3% (1) je odgovorilo da problem u donjem delu leđa nije uticao na smanjenje obima treninga, 71,4% (5) je u manjoj meri smanjilo a 14,3% (1) je umereno smanjilo. Uticaj problema u donjem delu leđa koji su uticali na učinak: 42,8% (3) nije uticao, 28,6% (2) u manjoj meri i 28,6% (2) umereno. Sve ispitanice su iskusile blage bolove u donjem delu leđa vezane za sport. (Tabela 2.)

Tabela 2. Uticaj povreda usled prenaprezanja u donjem delu leđa na trening prema polu

	Da li ste imali problema sa učešćem u treningu ili takmičenju zbog problema u donjem delu leđa tokom prošle sezone?				U kojoj meri ste smanjili obim učešća u treningu zbog problema u donjem delu leđa tokom prošle sezone?				
Odgovori	Puno učešće bez problema u donjem delu leđa	Smanjeno učešće zbog problema u donjem delu leđa	Puno učešće ali sa problemima u donjem delu leđa	Nisam mogao učestvovati i zbog problema u donjem delu leđa	Nema smanjenja	U manjoj meri	Umereno	Uglavnom	Nisam mogao uopšte učestvovati
Muškarci	35.7%	0%	64.3%	0%	50%	50%	0%	0%	0%
Žene	0%	0%	100%	0%	14.3%	71.4%	14.5%	0%	0%
	U kojoj meri su problemi u donjem delu leđa uticali na Vaš učinak u toku prošle sezone?					Do kog ste nivoa prošle sezone doživeli bol u donjem delu leđa vezan za Vaš sport?			
Odgovori	Nisu uticali	U manjoj meri su uticali	Umereno su uticali	Uglavnom su uticali	Nisam mogao uopšte učestvovati	Nema bola	Blagi bol	Umereni bol	Jak bol
Muškarci	64.3%	35.7%	0%	0%	0%	0%	100%	0%	0%
Žene	42.8%	28.6%	28.6%	0%	0%	0%	100%	0%	0%

Na pitanja u vezi problema sa ramenom, od ukupnog broja muških ispitanika: 20% (1) je odgovorio da je imao puno učešće u treningu ili takmičenju bez problema sa ramenom, 20% (1) puno učešće ali sa problemima sa ramenom i 60% (3) smanjeno učešće zbog problema sa ramenom. Da je u manjoj meri smanjio obim treninga prijavilo je 40% (2) ispitanika, 20% (1) umereno i 40% (2) uglavnom smanjilo obim treninga. Da problem sa ramenom nije uticao na učinak tokom prošle sezone odgovorilo je 40% (2) ispitanika, umereno 20% (1) i uglavnom

40% (2). Niko od ispitanika nije odgovorio da nije imao bolove u ramenu, 20% (1) je prijavilo blagi bol, dok je umereni bol u ramenu vezan za sport registrovan kod 60% (3) ispitanika a 20% (1) jak bol. Od ukupnog broja ispitanica koje su imale problem sa ramenom 22,2% (2) je imalo puno učešće bez problema sa ramenom i 77,8% (7) puno učešće ali sa problemima sa ramenom. Obim treninga zbog problema sa ramenom nije smanjilo 33,3% (3) ispitanice, u manjoj meri je smanjilo 55,6% (5) ispitanica 11,1% (1) umereno. Kod 22,2% (2) problem sa ramenom

nije uticao na učinak u toku prethodne sezone, 55,6% (5) u manjoj meri i 22,2% (2) umereno. Blagi bol u ramenu vezan za sport, imalo je

55,6% (5) ispitanica, a umeren i bez bola po 22,2% (2) ispitanica. (Tabela 3.)

Tabela 3. Uticaj povreda usled prenaprezanja u predelu ramena na trening prema polu

	Da li ste imali problema sa učešćem u treningu ili takmičenju zbog problema u ramenu tokom prošle sezone?				U kojoj meri ste smanjili obim učešća u treningu zbog problema u ramenu tokom prošle sezone?				
Odgovori	Puno učešće bez problema u ramenu	Smanjeno učešće zbog problema u ramenu	Puno učešće ali sa problemima u ramenu	Nisam mogao učestvovati zbog problema u ramenu	Nema smanjenja	U manjoj meri	Umereno	Uglavnom	Nisam mogao uopšte učestvovati
Muškarci	20%	60%	20%	0%	0%	40%	20%	40%	0%
Žene	22.2%	0%	77.8%	0%	33.3%	55.6%	11.1%	0%	0%
	U kojoj meri su problemi u ramenu uticali na Vaš učinak u toku prošle sezone?				Do kog ste nivoa prošle sezone doživeli bol u ramenu vezan za Vaš sport?				
Odgovori	Nisu uticali	U manjoj meri su uticali	Umereno su uticali	Uglavnom su uticali	Nisam mogao uopšte učestvovati	Nema bola	Blag bol	Umeren bol	Jak bol
Muškarci	40%	0%	20%	40%	0%	0%	20%	60%	20%
Žene	22.2%	55.6%	22.2%	0%	0%	22.2%	55.6%	22.2%	0%

DISKUSIJA

Smatra se da je 50% sportskih povreda kod dece i mladih povezana sa prenaprezanjem. Međutim detaljna analiza i podaci o povredama usled prenaprezanja kod dece i mladih sportista nedostaju, ali su po mišljenju sportista i trenera česte. Mladi sportisti su u većem riziku za nastanak povreda usled prenaprezanja od starijih. Za to se navodi više razloga: mineralizacija kostiju, razvoj hrskavice, nezrelost mišićno koštanog sistema, naglo povećanje trenažnih napora ali i nedostatak svesti o ovim povredama kod mladih sportista [1,4,11,13,16]. Ispitanici su različitih uzrasnih grupa, samim tim i sportskog staža, a učestvovali su u 5 sportskih disciplina. To je od značaja pošto je poznato da se povrede usled prenaprezanja mogu razlikovati u zavisnosti od uzrasta i tipa sporta [1]. Od ukupnog broja ispitanika skoro polovina (48.5%) je prijavila najmanje jednu iz grupe povreda usled prenaprezanja. Podaci iz literature se delom razlikuju, od toga da je prosečna prevalenca od 39% do 46,2% onih koji su prijavili neku povredu [7,16]. Veći broj povreda usled prenaprezanja registrovan je kod žena nego kod muškaraca 54,8% u odnosu na 44,4%. To odgovara podacima iz literature da su ove povrede češće kod osoba ženskog pola u odnosu na muški pol. Takođe se navodi da ne samo da su

češće već i da nastaju ranije [11, 13]. I kod muškaraca i kod žena najčešće povrede usled prenaprezanja su bile povrede kolena, koje su, kao i ukupan broj povreda, bile češće kod žena 47,1%. To odgovara podacima iz literature koji navode da su češće povređeni donji ekstremiteti. Smatra se da najveći broj povreda usled prenaprezanja uključuje koleno, i taj procenat se kreće od 35% do 52%. Navodi se i da su povrede kolena česte u više različitih sportova [3,10,13].

Bol u donjem delu leđa kod mladih sportista posebno zabrinjava jer je skeletni sistem u razvoju i posebno osetljiv. Sportisti koji su imali ranije problem u donjem delu leđa imaju 3-6 puta veći rizik za ponovne problem u donjem delu leđa [13]. Procenat sportista koji su prijavili problem u donjem delu leđa se razlikuje kod muškaraca i kod žena. Kod muškaraca od ukupnog broja onih koji su prijavili povrede usled prenaprezanja, njih 31,8% je prijavilo problem u donjem delu leđa. To je nešto više od procenta koji se navodi u literature (21%), mada ima podataka koji navode i čak 40% [10,13]. Kod žena taj procenat je niži i iznosi 17,6%. Za razliku od toga učestalost sportista koji su imali problem sa ramenom je veći kod žena (23%) nego kod muškaraca (11,4%). Čak i veći procenat koji su prijavile ispitanice daleko je manji od nekih podataka koji se mogu naći u

literaturi-43% (10). Udeo ispitanika koji su prijavili problem na dve ili više anatomskih lokalizacija je nešto viši kod muškaraca 15,9% u odnosu na žene 11,8%. U našem ispitivanju nije vršeno registrovanje o anatomskoj lokalizaciji povrede u odnosu na vrstu sporta. Uticaj povreda usled prenaprezanja na nivo treninga i takmičenja se delimično razlikovao u zavisnosti od anatomske lokalizacije. I kod muškaraca i kod žena najčešće je bilo zahvaćeno koleno. Ukoliko posmatramo koleno kao anatomsku lokalizaciju veći procenat muškaraca je prijavio da je imao puno učešće u treningu i takmičenju sa problemom- 61,1% u odnosu na 44,4% žena. Uticaj na učešće u treningu i takmičenju prijavili su ispitanici oba pola. Kod muškaraca je podjednak broj, njih 11,1%, prijavilo da je u manjoj meri i umereno smanjilo obim učešća. 16,7% ispitanica je u manjoj meri smanjilo obim učešća. I u jednom i drugom slučaju taj procenat je približan onom koji se može pronaći u literature gde navode da je 14% sportista prijavilo da utiču na njihovo trenutno učešće (16). Kod ispitanika je registrovano 16,7% kod kojih su problemi sa kolenom u manjoj meri uticali na učinak u takmičenju, kod 6,7% je registrovan umerni uticaj na učinak i čak 22,2%-uglavnom uticaj na učinak u toku takmičenja. Procenat ispitanica koje su prijavile da je problem sa kolenom u manjoj meri uticao na učinak u takmičenju je nešto veći i iznosi 38,9%. Ispitanici su prijavili blagi bol zbog problema sa kolenom u 55,6%, umereni bol u 33,3% i jak bol u 11,1% slučajeva. Ispitanice blagi bol u 38,9%, umereni 27,8% i jak bol u 11,1% slučajeva. Imajući u vidu navedene učestalosti, moglo bi se zaključiti da su povrede kolena nešto veći uticaj imale kod muških ispitanika u odnosu na ženske. Ukoliko posmatramo donji deo leđa kao anatomsku lokalizaciju povrede usled prenaprezanja, one su nešto veći uticaj imale kod ženskih ispitanika. Dok je kod muškaraca njih 64,3% prijavilo puno učešće u treningu ili takmičenju ali sa problemima u donjem delu leđa, to je prijavilo 100% ispitanica kod kojih je registrovan problem u donjem delu leđa. Njih 71,4% je prijavilo da je u manjoj meri smanjilo obim treninga dok je kod muškaraca taj procenat 50%. Kod ispitanika njih 35,7% je prijavilo da je problem u donjem delu leđa u manjoj meri uticao na učinak u takmičenju, dok

je kod ispitanica taj procenat iznosio 28,6%. Međutim, isti broj 28,6% je prijavilo da je umereno uticao na učinak u takmičenju, dok kod muških ispitanika taj odgovor nije registrovan.

Ispitanici oba pola najveće problem imali su kada je rame bilo anatomska lokalizacija povreda usled prenaprezanja. Kod muškaraca 20% je prijavilo puno učešće ali sa problemima sa ramenom, dok je čak 60% prijavilo smanjeno učešće. Kod žena 77,8% je prijavilo puno učešće ali sa problemima sa ramenom. Obim treninga zbog problema sa ramenom u manjoj meri smanjilo je 40% ispitanika i 55,6% ispitanica, dok je 20% ispitanika umereno smanjilo obim treninga. Povrede u predelu ramena imale su dosta veliki uticaj na učinak u takmičenju. Tako je 40% ispitanika prijavilo da su povrede ramena uglavnom uticale na učinak dok je 55,6% ispitanica prijavilo da su povrede ramena u manjoj meri uticale na učinak. Kod oba pola je u visokom procentu registrovano prisustvo bola.

Naše ispitivanje ima nekoliko ograničenja. Pre svega retrospektivno prikupljanje podataka koje od sportiste zahteva da se seti povrede. Ali prospektivno prikupljanje, iako se preporučuje, ne mora biti i kompletnije. Neka istraživanja su pokazala i da su ti rezultati slični, objašnjavajući to činjenicom da sportisti lakše prijave povredu na kraju sezone (8,13). Povrede usled prenaprezanja su registrovane na osnovu prijave sportiste i nije zahtevalo kliničku potvrdu, što je možda dovelo da se i "uobičajeni bol" vezan sa treningom registruje kao povreda usled prenaprezanja.

ZAKLJUČAK

Našim istraživanjem neka iz grupe povreda usled prenaprezanja registrovana je često 48,5%, kod gotovo polovine ispitanika. Povrede su češće registrovane kod osoba ženskog pola. Kod obe grupe ispitanika koleno je bilo najčešća anatomska lokalizacija. U odnosu na nivo treninga i takmičenja povrede kolena su nešto veći uticaj imale kod ispitanika muškog pola. Povrede lokalizovane u donjem delu leđa imale su veći uticaj na nivo treninga i takmičenja u žena. Najveći uticaj na nivo treninga i takmičenja, kod ispitanika oba pola, imale su povrede ramena.

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OVERUSE INJURIES IN YOUNG ATHLETES

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Summary: In overuse injuries, there is no clear single event that can be associated with the injury. They are thought to arise as a result of repeated submaximal loading of the musculoskeletal system that is not followed by adequate rest. The aim of the study is to determine the incidence of overuse injuries in young athletes, their gender structure and anatomical localization, as well as their impact on the level of training and competition in the previous season. The study is based on the analysis of questionnaires completed by athletes at the end of the 2018/2019 season. The Oslo Sports Trauma Research Center Overuse Injury Questioner questionnaire was translated into Serbian and modified to reflect the previous season. A total of 171 athletes participated, of which 99 (58.1%) were men and 72 (41.9%) were women. The research involved athletes aged 15 to 30 who competed in 5 sports disciplines: basketball, football, volleyball, handball and karate. Of the 171 athletes who participated in the trial, 48.5% registered at least one in the group of overweight injuries. Of the 99 male athletes, 44.4% reported injuries. In women, 54.8% of the total were registered in 72. According to anatomical localization, in men, knee injuries were registered in 40.9%, back injuries in 31.8%, injuries in multiple anatomic locations in 15.9% and shoulder injuries in 11.4%. In women, knee injuries were reported in 47.1%, shoulder injuries in 23%, back injuries 17.6% and more localization 11.8%. Of the men who reported a knee injury, 61.1% reported having had a lot of involvement but with knee problems, as well as reduced training. A little more than half reported that they did not affect performance during the last season and reported mild knee pain. In the majority of respondents, they reported full participation without knee problems and did not reduce the amount of training and that their knee problems did not affect performance. The highest percentage reported mild pain. In male subjects with lower back injury, the highest percentage, 64.3%, reported full participation, but with problems, half reduced training. In the largest percentage, 64.4% had no effect on performance during the previous season and all subjects reported mild pain. All the respondents answered that they had full participation but with problems in the lower back. The largest 71.4% reduced training volume to a lesser extent, while 42.8% said the lower back problem did not affect performance during the previous season and all reported mild pain. Questions about shoulder problems the majority of male respondents, 60%, said they had reduced participation due to shoulder problems. An equal percentage of 40% reported that they had reduced their training volume to a lesser extent and generally decreased it. More than half, 60% reported having a shoulder problem that affected performance, and all respondents reported some level of shoulder pain. Also, the largest number of female respondents, 77.8%, reported full participation but with shoulder problems, decreased training and affected performance during last season. The highest percentage reported some level of pain.

In our research, some of the injuries caused by overstress were registered in almost half of the respondents, 48.5%. Injuries are more commonly reported in female subjects. In both groups of subjects, knee was the most common anatomical localization

Keywords: sport's overuse, sport's injuries, young athletes

INTRODUCTION:

The participation of young people in sports and regular physical activity offers many benefits: improving general health, socializing with peers, increasing self-esteem. Regular physical activity and sports have been widely promoted due to its many positive effects. Contributes to improving

the function of the cardiovascular system, has a positive effect on the development of the nervous and muscular systems, reduces anxiety [1,2,3,4,5]. Although children and young people should be encouraged to participate in a number of different sports activities and develop different skills, it is increasingly common today

for young athletes to participate in only one sport and the so-called "early specialization" in sports, which often ends before the end of primary school. Young people, like their parents, start with high intensity training from the desire to participate in elite leagues, get scholarships and the like. All this leads to more frequent injuries in sports. A large number of participants in sports activities have led to sports being the primary cause of injury in young people [1,6,7].

Today, sports injuries are most often divided into acute (traumatic) and overuse injuries. Traumatic injuries are the result of a specific

event, which can be identified. In overuse injuries, there is no single individual event that can be associated with the injury. Overuse injuries are thought to result from repeated submaximal loading of the musculoskeletal system that is not followed by adequate rest. These are repetitive microtrauma resulting from repeated exposure to force or a large number of repetitions. In most cases, the tissue recovers at the beginning of the process without visible signs and symptoms, however as the process continues the possibility of adaptation is depleted and results in clinically clear symptoms [1,4,8,9,10,11,12,13]. Figure 1

Figure 1. Hypothetical overview of the onset of tissue injury and pain in a typical overuse injury. Adopted from R. Bahra. No injuries, but plenty of pain? On the methodology for recording overuse symptoms in sports. *Br J Sports Med* 2009;43:966-972. doi:10.1136/bjsm.2009.066936

Overuse injuries are considered to be one of the most common etiological factors leading to injuries in young athletes, and that almost half of sports injuries in children and young people belong to overuse injuries. Overuse injuries can affect: bones, muscles, tendons, ligament. There are several risk factors for the occurrence of an overuse injuries as: previous injury, adolescent age, higher training intensity, etc. Overuse injuries are considered to be underestimated in the literature because the majority of studies define injuries based on time off from competition. While more recent studies have cited the term "presence of any physical discomfort", and above all pain, which has led to a significantly higher number of reported overuse injuries [1,8,9,12,13]. However, there are also works that indicate that the term overuse injuries is used too often and advise that

it should be avoided until there is definitive evidence of a cause of injury. Overuse injuries most commonly affect the knee, shoulder, and lower back [10,11,13,14,15,16]. The importance of regular monitoring and protection of the health of athletes is increasingly recognized. For this reason, several systems for reporting and monitoring illnesses and injuries in athletes have been developed. Since 2008, the International Olympic Committee has also developed an injury monitoring system. The first official guidelines were for reporting and monitoring injuries in football, and later they formed the basis for other sports. Nowadays, a questionnaire developed in 2013 to register overuse injuries is increasingly used. The Oslo Sports Trauma Research Center Overuse Injury Questionnaire has 4 key questions and a response and scoring system. The questionnaire collected

data based on whether the athletes experienced / felt pain, limited participation in training or competition, and reduced training or competition volume [2,8,10,15,16,17].

The goal. The aim of the study is to determine the frequency of overuse injuries in young athletes, their gender structure and anatomical localization, as well as their impact on the level of training and competition in the previous season.

METHOD

The research is based on the analysis of questionnaires completed by athletes at the end of the 2018/2019 season. The study involved 171 athletes, ages 15 to 30. The tested athletes competed in 5 sports disciplines: basketball, football, handball, volleyball and karate. We used the Oslo Sports Trauma Research Center questionnaire Overuse Injury Questioner translated into Serbian and modified so that the questions relate to the past season.

RESULTS

A total of 171 athletes participated, of which 99 (58.1%) were men and 72 (41.9%) were women. The study involved athletes aged 15 to 30 years competing in 5 sports disciplines: basketball, football, volleyball, handball and karate. Athletes aged 15 years were 29.7% (51), 16 years 18.8% (32), 17 years 5.45% (9), 18 years 10.8% (19), 19 years 2.8% (5), 20 years 5.45% (9), 21 years 2.8% (5), 22 years 5.4% (9), 23 years 5.4% (9), 24 years 4% (7), 25 years 2.8% (5), 27 years 1.3% (2), 28 years 2.8% (5), 29 years 1.3% (2) And 30 years 1.35% (2). Of the 171 athletes who participated in the test, 48.5% (83) registered at least one overuse injuries. Of the 99 male athletes, 44.4% registered overuse injury (44). In women, overuse injury were registered in 54.8% (39) of the total 72. According to anatomical localization, in men, knee injuries were registered in 40.9% (18), back injuries in 31.8% (14), injuries at multiple anatomical locations at 15.9% (7) and shoulder injury at 11.4% (5). In women, knee injuries were reported in 47.1% (18), shoulder injuries in 23% (9), back injuries 17.6% (7) and multiple localizations 11.8% (5).

Among men who reported knee injury, 61.1% (11) reported having had full participation in training and competition but with knee

problems, 27.8% (5) had full participation without knee problems, 11.1% (2) decreased participation due to knee problems And no one reported being unable to participate. 72.2% (13) did not reduce the amount of training due to knee problems, 11.1% (2) reported that they decreased the volume of training due to knee problems, 11.1% (2) moderately decreased, 5.6% (1) decreased to a greater extent. When asked how much your knee problem affected your performance over the past season, 55.5% (10) said they had no influence, 16.7% (3) responded to a lesser extent, 5.6% (1) they were moderately influenced, while 22.2% (4) responded that they were mostly influenced. Mild sports-related knee pain reported 55.5% (10), 33.4% (6) reported moderate pain, and 11.1% (2) reported severe pain. Of women, 55.5% (10) reported full participation without knee problems, 44.5% (8) reported full participation but with knee problems, no cases of reduced participation were reported. A total of 83.3% (15) did not reduce training volume, 16.7% (3) reported that they reduced training volume to a lesser extent, none reported a larger reduction volume. A total of 61.1% (11) reported that knee problems did not affect performance during the past season, while 38.9% (7) reported that they had less impact on performance, there was no response that they were moderately or mainly affected. 22.2% (4) did not report knee pain, 38.9% (7) reported mild pain, 27.8% (5) moderate pain, and 11.1% (2) severe sports-related knee pain. (Table 1.)

In men with lower back injury, 35.7% (5) reported full participation in training or competition with no problems in the lower back, 64.3% (9) reported full participation but with problems in the lower back. until reduced participation was reported. 50% (7) did not reduce the volume of training due to lower back problems, 50% (7) reduced it to a lesser extent, no moderate or major response. Respondents in 64.4% (9) answered that lower back problems did not affect performance during the last season, 35.7% (5) responded that they were less affected while there was no response that they were more affected. Subjects who had a problem in the lower back reported mild pain. In women, all respondents said that they had full participation in training or competition but with problems in the lower back. Of these, 14.3% (1) replied that the problem in the lower back did

not affect the decrease in training volume, 71.4% (5) reduced it to a lesser extent, 14.3% (1) moderately decreased until it was more extensive. When asked about the extent to which lower back problems affected their performance, over the past season, 42.8% (3) answered that it was unaffected, 28.6% (2) to a lesser extent and 28.6% (2) to a moderate extent while there was no greater response. All respondents answered that they experienced mild lower back pain related to sports. (Table 2.)

To questions about shoulder problems, during last season, of the total number of male respondents, 20% (1) answered that they had a full participation in training or competition without shoulder problems, 20% (1) a full participation but with problems with shoulder and 60% (3) responded that he had reduced involvement due to shoulder problems. None of the respondents answered that they did not reduce the volume of training due to shoulder problems. 40% (2) of the respondents reported that they reduced the training volume to a lesser extent, 20% (1) moderately and 40% (2) mostly reduced the training volume. 40% (2) of the respondents answered that the shoulder

problem did not affect the performance during the last season, there was no answer to a lesser extent, 20% (1) and mostly 40% (2) answered moderately. None of the respondents answered that they did not have shoulder pain, 20% (1) reported mild pain, while moderate sport-related shoulder pain was reported in 60% (3) of the subjects and 20% (1) severe pain.

Of the total number of femal respondents who had a shoulder problem, 22.2% (2) had full participation without shoulder problems and 77.8 (7) full participation but with shoulder problems. The volume of training due to shoulder problems did not decrease 33.3% (3) of the examinee, to a lesser extent reduced 55.6% (5) of the respondents 11.1% (1) moderately. In 22.2% (2) the shoulder problem did not affect performance during the previous season, 55.6% (5) responded that it had less impact on performance and 22.2 (2) moderately. 55.6% (5) women had mild shoulder pain related to sports during the last season, while 22.2% (2) women had moderate pain and the same percentage 22.2% (2) did not report pain in the last season. (Table 3.)

Table 1. Replies regarding overuse knee injuries

	Have you had any difficulties participating in normal training and competition due to knee problems during the past season?				To what extent have you reduced you training volume due to knee problems during the past season?				
Answers	Full participation without knee problems	Reduced participation due to knee problems	Full participation but with knee problems	Cannot participate due to knee problem	No reduction	To a minor extent	To a moderate extent	To a major extent	Cannot participate at all
Men	27.8%	11.1%	61.1%	0%	72.2%	11.1%	11.1%	5.6%	0%
Women	55.6%	0%	44.4%	0%	83.3%	16.7%	0%	0%	0%
	To what extent have knee problems affected your performance during the past season?					To what extent have you experienced knee pain related to your sport during the past season?			
Answers	No effect	To a minor extent	To a moderate extent	To a major extent	Cannot participate at all	No pain	Mild pain	Moderate pain	Severe pain
Men	55.5%	16.7%	5.6%	22.2%	0%	0%	55.5%	33.4%	11.1%
Women	61.1%	38.9%	0%	0%	0%	22.2%	38.9%	27.8%	11.1%

Table 2. Replies regarding overuse lower back overuse injuries

	Have you had any difficulties participating in normal training and competition due to lower back problems during the past season?				To what extent have you reduced you training volume due to lower back problems during the past season?				
Answers	Full participation without lower back problems	Reduced participation due to lower back problems	Full participation but with lower back problems	Cannot participate due to lower back problem	No reduction	To a minor extent	To a moderate extent	To a major extent	Cannot participate at all
Men	35.7%	0%	64.3%	0%	50%	50%	0%	0%	0%
Women	0%	0%	100%	0%	14.3%	71.4%	14.5%	0%	0%
	To what extent have lower back problems affected your performance during the past season?				To what extent have you experienced lower back pain related to your sport during the past season?				
Answers	No effect	To a minor extent	To a moderate extent	To a major extent	Cannot participate at all	No pain	Mild pain	Moderate pain	Severe pain
Men	64.3%	35.7%	0%	0%	0%	0%	100%	0%	0%
Women	42.8%	28.6%	28.6%	0%	0%	0%	100%	0%	0%

Table 3. Replies regarding overuse shoulder overuse injuries

	Have you had any difficulties participating in normal training and competition due to shoulder problems during the past season?				To what extent have you reduced you training volume due to shoulder problems during the past season?				
Answers	Full participation without shoulders problems	Reduced participation due to shoulders problems	Full participation but with shoulders problems	Cannot participate due to shoulders problem	No reduction	To a minor extent	To a moderate extent	To a major extent	Cannot participate at all
Men	20%	60%	20%	0%	0%	40%	20%	40%	0%
Women	22.2%	0%	77.8%	0%	33.3%	55.6%	11.1%	0%	0%
	To what extent have shoulder problems affected your performance during the past season?				To what extent have you experienced shoulder pain related to your sport during the past season?				
Answers	No effect	To a minor extent	To a moderate extent	To a major extent	Cannot participate at all	No pain	Mild pain	Moderate pain	Severe pain
Men	40%	0%	20%	40%	0%	0%	20%	60%	20%
Women	22.2%	55.6%	22.2%	0%	0%	22.2%	55.6%	22.2%	0%

Discussion. It is estimated that 50% of sports injuries in children and young people are related to overuse injuries. However, detailed analysis and data on overuse injuries in children and young athletes are lacking, but in the opinion of athletes and coaches overuse injuries are very common. Young athletes are more at risk of developing overuse injuries than older athletes. There are several reasons for this: bone mineralization, cartilage development, immaturity of the musculoskeletal system, a sudden increase in training efforts, but also a lack of awareness of overuse injuries in young athletes [1,4,11,13,16]. In our study, 171

subjects participated, most of them men. Respondents are of different age groups, including sports experience, and have participated in 5 sports disciplines. This is important since it is known that overuse injuries may differ depending on the age and type of sport [1]. Of the total number of respondents, 48.5% reported at least one in the overuse injuries group. The literature data differ in part from the fact that the average prevalence of all overuse injuries is 39% to 46.2% of those who reported an injury [7,16]. A higher number of overuse injuries was registered in women than in men, 54.8% compared to 44.4%. This is

consistent with literature data that overuse injuries are more common in female than male. It is also stated that not only are overuse injuries more common but also occur earlier [11,13]. In men and women, the most common overuse injuries were knee injuries, which, like the total number of overuse injuries, were more common in women with 47.1%. This corresponds to literature data that indicate that the lower extremities are more commonly injured. Most overuse injuries are considered to include the knee, and this percentage ranges from 35% to 52%. It is also stated that overuse injuries knees are common in many different sports [3,10,13].

Lower back pain in young athletes is of particular concern because the developing skeletal system is particularly sensitive. Athletes who have had a lower back problem earlier are 3-6x more likely to have a lower back problem again [13]. The percentage of athletes who report a problem in the lower back varies between men and women. Among men out of the total who reported overuse injuries, 31.8% reported a problem in the lower back. This is slightly higher than the percentage reported in the literature of 21%, although there is data that even 40% [10,13]. In women, this percentage is lower and is 17.6%. In contrast, the proportion of athletes who reported having a shoulder problem was higher in women by 23% compared to men by 11.4%. An even higher percentage reported by the respondents is far less than some of the data that can be found in the literature I, citing 43%. [10]. The percentage of subjects who reported a problem at two or more anatomical sites was slightly higher in males 15.9% compared to females 11.8%. In our study, no anatomical localization of the injury was registered in relation to the type of sportso additional testing is needed to determine if the difference in the percentage of reported injuries, by anatomical localization, is directly related to sports discipline

The impact of overuse injuries on the level of training and competition differed in part depending on the anatomical localization of overuse injuries. In both men and women, the knee was most commonly affected. If we consider the knee as an anatomic localization of overuse injuries a higher percentage of men reported having had a full participation in training and competition but with knee

problems, 61.1% of them compared to 44.4% of women. The impact on participation in training and competition was reported by respondents of both sexes. In men, an equal number, 11.1%, reported a smaller and moderate decrease in participation. Among women, 16.7% had a smaller decrease in participation rates, while there were no women who reported a moderate decrease. In both cases, this percentage is close to that found in the literature, and they state that 14% of athletes reported that overuse injuries influenced their current participation [16]. Respondents registered 16.7% of those who had a lesser impact on performance in the competition, 6.7% had a moderate effect on performance, and as many as 22.2% reported that it mainly affected performance during the competitions. The percentage of respondents who reported that their knee problem had a lesser impact on performance in the competition was slightly higher and amounted to 38.9%, but no cases were reported that had a moderate or major impact on performance. Respondents reported mild pain due to knee problems in 55.6%, moderate pain in 33.3%, and severe pain in 11.1% of cases. The subjects had mild pain in 38.9%, moderate pain 27.8% and severe pain in 11.1% of cases. Given the above percentages, it could be concluded that knee injuries had a slightly greater impact on male subjects than in female subjects

If we consider the lower back as an anatomic localization of the overuse injuries, they had a somewhat greater impact in the female subjects. While 64.3% of men reported full participation in training or competition but with problems in the lower back, 100% reported having a problem in the lower back. 71.4% reported that they had reduced training to a lesser extent, while in men it was 50%. Among respondents, 35.7% reported that lower back problems had less impact on performance in the competition, while in respondents, this percentage was 28.6%. However, the same number of 28.6% reported that it moderately influenced the performance in the competition, whereas in the male subjects this response was not registered. In men, 20% reported full participation but with shoulder problems, while as many as 60% reported reduced participation. In women, 77.8% reported full participation but with shoulder problems. The volume of training due to shoulder problems was reduced to a lesser

extent by 40% of respondents and 55.6% of respondents, while 20% of respondents moderately reduced the volume of training. Overuse injuries in the shoulder area also had quite a big impact on performance in the competition. Thus, 40% of respondents reported that shoulder injuries mainly affected performance, while 55.6% of respondents reported that shoulder injuries had less impact on performance. In both sexes, the presence of pain was high.

Our testing has several limitations. First of all, retrospective data collection that requires the athlete to remember the injury. But prospective collection, while recommended, does not ? it must also be more complete. Some studies have also shown that these results are similar, explaining that athletes report injuries more easily at the end of the season [8,13]. Overuse injuries was registered on the basis of the

athlete's application and did not require clinical confirmation, which may have led to the fact that the "usual pain" associated with training was registered as overuse injuries.

Conclusion. In our study, some of the overuse injuries group was registered in almost half of the respondents, 48.5%. Injuries are more commonly reported in female subjects. In both groups of subjects, knee was the most common anatomic localization of overuse injuries. In comparison to the level of training and competition of the knee injury, the male respondents had a somewhat greater influence. Injuries localized in the lower back had a greater impact on the level of training and competitions, on the female subjects. The greatest impact on the level of training and competition in the subjects of both sexes had shoulder injuries.

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