The locomotor system as seen in Brazilian medical journals: a restricted collection of papers

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Summary

This review covers recent publications on the motor system (orthopedics and movement) in Brazilian journals recently admitted to the ISI-Thomson Journal of Citations Index. Two of these are still pleading for admission into PubMed which will eventually enhance their global visibility. We offer this contribution to experts on these areas who are regular readers of Revista da Associação Médica Brasileira. Full free copies of all of them are available at www.scielo.br. The main areas covered are orthopedics of limb articulations, fractures, movement, posture, gait, exercise and animal models.

Keywords: Articulation disorders; fractures, bone; movement; posture; gait.

Resumo

O sistema locomotor nos periódicos médicos brasileiros: um grupo restrito de artigos

Esta revisão abrange publicações recentes sobre o sistema locomotor (ortopedia e movimento) em periódicos brasileiros recentemente incluídos na plataforma de citações ISI-Thomson. Dois destes periódicos ainda estão pleiteando inclusão no PubMed o que aumentará sua visibilidade. Oferecemos esta contribuição para especialistas nestas áreas de interesse e que são leitores regulares da Revista da Associação Médica Brasileira. Cópias integrais dos artigos citados estão disponíveis gratuitamente no site www.scielo.br. Os principais temas cobertos são ortopedia e articulações dos membros, fraturas, movimento, postura, marcha e modelos animais.

Unitermos: Transtornos da articulação; fraturas ósseas; movimento; postura; marcha.

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Submitted on: 05/25/2011
Approved on: 05/27/2011

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Conflict of interest: None.

Introduction

This article covers scientific journals published by journals newly admitted to the ISI-Thomson Journal of Citations Report. The fact that some of them have not so far been included in the National Library of Medicine listings means that they are not easily available to the scientific world in general. This lead us to divulge this work to our readers, with the aim of making them more readily available worldwide.

This review of articles centering on the clinical physiology and pathology of orthopedics and sports medicine published in Brazilian journals in recent years highlights an interesting type of distribution of themes and brings forth a fair amount of novel contributions. Table 1 summarizes a collection of 108 recent articles devoted to these subjects from three recently ISI-Thomson indexed journals. Two of them are still not listed in PubMed.

These articles have been arbitrarily classified into the seven categories displayed in Table 1 to allow for a better and more expert evaluation of what is available.

Table 1 – Distribution of cited articles by journals and subject

	Total	Acta Ortop Bras	Clinics	Rev Bras Med Esporte
Lower limb	33	20	13	
Upper limb	11	9	2	
Vertebral column	5	2	3	
Exercise, posture, gait	20	5	12	3
Animal models	23	16	7	
Trauma	4	3	1	
Other	12	1	11	
Total	108	56	49	3

Orthopedic evaluation of the lower limbs

Articles devoted to orthopedic problems in the human lower limb are ranked top and comprise nearly one third of the entire collection. They cover problems related to the hip, knee and ankle articulations, as well as fractures.

Eleven articles cover orthopedic evaluation of the knee. Total knee replacement is discussed by Guglielmetti *et al.*[1], who evaluated mid-term follow-up results of the application of a total knee replacement with a mobile tibial bearing design and found that, with the exception of the cases requiring arthroplastic revision due to septic or aseptic loosening, such knee replacement presents good results in a mid-term follow-up. In contrast, Camanho[2] presents a series of nine patients with ankylosis in their knees that were submitted to a total arthroplasty to lessen their pain and improve their functional limitation. For these patients, arthrodesis remained a possibility in the event of arthroplasty failure. Based on the latest follow-up, there has been no need to perform arthrodesis for any of the patients, showing that a total arthroplasty could be an option for treatment in knee ankylosis. Still on the subject of knee reconstruction, Angelini *et al.*[3] compared the accuracy of tunnel placement and graft isometry for anterior cruciate ligament reconstruction performed using a computer-assisted navigation system (Orthopilot) and using traditional instruments. They found no differences in tunnel position between the groups. Nonetheless, better isometry was achieved in the Orthopilot group than with conventional instruments. Navarro *et al.*[4] evaluated the relationship between the width and length of the lateral patellofemoral ligament and the size of the lateral patellar articular facet in cadavers and observe that the shorter the ligament the greater the width of the facet. Pain diagnosis was the subject of Ramos *et al.*[5], who investigated the prevalence of pain complaints among individuals with pathological knee conditions and evaluated palpation of the inferior pole of the patella as a diagnostic test for patellar tendinopathy. They conclude that palpation of the inferior pole of the patella is a diagnostic procedure with high sensitivity and moderate specificity for diagnosing patellar tendinopathy, especially among individuals who perform activities with high functional demands. Pain prevention by anesthesia was the object of Arslan *et al.*[6], who investigated the regional intravenous anesthesia procedure in knee arthroscopy and evaluated the effects of adding ketamine over the anesthesia block charactery and tourniquet pain. They found that regional intravenous anesthesia performed with the doses and volumes commonly used in knee arthroscopy may be an inadequate block among patients with high BMI values. Moreover, the addition of ketamine to the local anesthetic solution may produce a partial solution by shortening the onset of sensory block and prolonging the time until the first analgesic is required. Knee osteoarthritis was the subject of Carvalho *et al.*[7] , who prospectively assessed the efficiency of a guidance manual for patients with knee osteoarthritis in relation to pain, range of movement, muscle strength and function, active goniometry, manual strength test and function and claim that this guidance can be attained at home with the use of a proper manual. Costa *et al.*[8] evaluated the difference in isokinetic strength of hip muscles between patients with knee osteoarthritis and matched healthy controls, in order to establish the correlation between this isokinetic strength and pain and function in patients with knee os-

teoarthritis, and found that such patients exhibit lower isokinetic strength in the hip muscles than healthy control subjects. They claim that strengthening the muscles surrounding the hip joint may help to decrease pain in people with knee osteoarthritis.

Some correlations between pain/function and peak torque were found. The early development of knee movement is addressed in an article by Morais Filho *et al.*[9], who assessed the movement pattern of knee and ankle during stance phase in order to analyze the behavior of these parameters during gait maturation process. They claimed that, in the studied group, knee flexion during stance phase was different between children (mean age 9.7 years) and adults (mean age 25 years), which suggests that gait maturation process can last until the second decade of life. Hollanda *et al.*[10] evaluated clinical outcomes of the osteochondral autologous transplantation technique for treatment of osteochondral defects of the knee in athletes and conclude that transplantation promoted a subjective improvement of the knee in athletes. Return to sports activity occurred in a specific group of patients.

Five articles cover orthopedic problems of the hip. Guimarães *et al.*[11] endeavored to translate and cross-culturally adapt the Harris Hip Score for the Portuguese language and conclude that the Brazilian version of the Harris Hip Score provides another important tool for assessing quality of life of patients with hip disorders. A further study is currently underway to evaluate the reliability and validity of the culturally adapted version. On a different note, Freitas *et al.*[12] evaluated the relationship between abdominal injuries and the introduction of guide wire in experimental hip surgery. They proposed a scoring system and a medical management based on the distance traveled by the guide wire from the quadrilateral plate to the damaged anatomical structure. They postulated that the guide wire must not exceed the quadrilateral plate. Preventive measures are important in the pre- and intra-operatory stages and the score and medical management proposed in this study should be carefully observed in cases of injury. A developmental defect is the subject of Cordeiro *et al.*[13], who evaluated the results of surgical treatment of developmental dysplasia of the hip treated in early walking apprenticeship age. Femoral shortening, open reduction and pelvic osteotomy (Salter or Chiari) and radiographic assessment were performed. The authors observed 23 (69.70%) good, 5 (15.15%) regular and 5 (15.15%) bad results. None of these radiographic parameters were relevant to predicting final results. Osteoporosis is the theme of Satomi *et al.*[14], who assessed the profile of osteoporosis treatment among patients hospitalized due to hip fractures at a tertiary-level university hospital in order to compare the impact of hospitalization on approaches toward treating bone mass losses. They reported that investigations and treatments of osteoporosis and strategies for preventing new fractures were not implemented during the hospitalization of these elderly patients with hip fractures, even though this is the most feared complication of osteoporosis. They emphasized that these data need to be disseminated so that professionals dealing with elderly patients are attentive to the need for primary and secondary prevention of osteoporosis due to the impact of fractures on these patients quality of life, independence, morbidities, and mortality. Vicente *et al.*[15] compared the long-term survivorship rates and the rates of successful osseointegration between two different types of uncemented acetabular components, titanium-based and cobalt-based alloys. They concluded that, during the first ten years after surgery, there was no significant difference between these two types of uncemented cups with regard to either prosthesis survivorship or successful osseointegration.

Eight articles cover ankle/foot orthopedic articles. Ferreira *et al.*[16] determined and compared thresholds of cutaneous sensitivity of lower extremities in diabetic patients with an ulcer on only one lower extremity by means of a Pressure-Specified Sensory Device, and found that it is possible to differentiate levels of sensation between extremities with and without ulcers in diabetic patients. Early development of movement is covered by Tartaruga *et al.*[17], who compared the maximum subtalar pronation and its moment of occurrence during the stance phase, determined based on two mathematical models consisting of two and four reference points, respectively. They found that the measure of maximum subtalar pronation is influenced by the mathematical model adopted. However, the moment of occurrence of maximum subtalar pronation during the stance phase is independent of the model. Ferreira *et al.*[18] endeavored to identify the epidemiological profile of patients undergoing orthopedic treatment for complications of feet and ankles due to diabetes, and to try to establish the sequence of events that led to amputation of the limb. They claim that ulceration of the sole of the foot was the most common complication in our series of patients, the majority of whom was in their seventies, presented type II diabetes, was insulin dependent, and did not have adequate control of glycemia. Loss of sensitivity of the foot associated with pre-existing deformities were identified as the main causes of secondary infections culminating in amputation of the limb. Silva and Fucs[19] retrospectively evaluated the treatment of spastic pes planus valgus with the technique presented by Pisani and conclude that in spite of a restricted clinical evaluation, the severity and the degree of involvement of the patients the Pisani technique is still a good option when comparing with osteotomies and arthrodesis in the treatment of the still flexible deformities. Umeda *et al.*[20] demonstrated the clinical results of triple arthrodesis in patients with cerebral palsy to determine whether there is any correspondence between the results and the AOFAS

scale, and changes in radiographic angles between the pre- and postoperative periods. They concluded that triple arthrodesis corrects or improves these deformities, and also that patients showed a high level of satisfaction, most of them with a plantigrade foot. The AOFAS scale had low correlation with the result. The talur-first metatarsal and calcaneal pitches were the most sensitive in the evaluation of the surgical procedure. Maranho *et al.*[21] assessed the percutaneous Achilles tendon sectioning technique using a large gauge needle for the correction of residual equinus of congenital clubfoot treated by the Ponseti method. They claimed that the procedure proved to be efficient and safe to correct this specific defect. Greve *et al.*[22] compared radial shockwave treatment and conventional physiotherapy for plantar fasciitis and claimed that shockwave treatment was not more effective than conventional physiotherapy treatment when evaluated three months after the end of treatment. Bacarin *et al.*[23] investigated and compared the influence of a previous history of foot ulcers on plantar pressure variables during gait of patients with diabetic neuropathy and found that a history of foot ulcers in the clinical history of diabetic neuropathy subjects influenced plantar pressure distribution, resulting in an increased load under the midfoot and rearfoot and an increase in the variability of plantar pressure during barefoot gait. The progression of diabetic neuropathy was not found to influence plantar pressure distribution.

Seven articles cover fractures. Santili *et al.*[24] studied the relatively common occurrence of tibial diaphyseal fractures in children and adolescents which often evolve with good results through traditional conservative methods and suggested that the approach should consider and respect some features regarding age, place of affection (whether proximal or distal), type of fracture and therapy. Sunada *et al.*[25] compared the stiffness of three different assemblies of bridging plates with intramedullary locking nails in cadaveric models of tibial fractures type C and found that in such fractures, there is more mobility at the distal segment on the coronal plane when the fracture is fixed with 14 and 18 holes bridging plates as compared to fractures fixed with non-reamed intramedullary locking nails. Pires *et al.*[26] evaluated inter-observer reproducibility of different classifications for shaft fractures of the femur in adults and found a high rate of concordance between observers for such fractures of the femur in adults. Torres *et al.*[27] described a new and simple way to transplant/transpose a vascularized fibular graft from the fibula to the femur diaphysis with no need of microsurgery and concluded that the cutaneous gastrocnemius-fibular flap is a new weapon for the reconstructive surgeon; it is practical and reliable, and its reduced surgery time and principle of construction will be applicable to the creation of other flaps. Freitas *et al.*[28] evaluated the role of lateral tibial cortex integrity in open wedge tibial osteotomy and found that integrity of lateral tibial cortex added stability to open wedge tibial osteotomies. Models with lateral cortical integrity demonstrated superiority in biomechanical stiffness even under torsion or compression. In torsion tests, models with a gap on the lateral cortex fixed with a lag or position screw to promote lateral stabilization had similar biomechanical behavior to those with lateral cortex integrity. Astur Neto *et al.*[29] performed radiographic and functional evaluations of the complications of diaphyseal fractures of the femur associated with ipsilateral fractures of the trochanter or the neck of the femur. Their data indicate that the association of diaphyseal with trochanteric femur fractures showed better radiographic and functional results with less complication than the association of diaphyseal and femoral neck fractures. Cabrita *et al.*[30] described a new technique for removing the distal fragments of broken intramedullary femoral nails without disturbing the non-union site and claimed that this original technique allows surgeons to remove the distal fragment of fractured femoral intramedullary nails without opening the non-union focus or using special surgical instruments.

Two articles cover general pathology of the lower limb. Belangero *et al.*[31] evaluated the performance of an extensible nail with hooks, named HIMEX, in osteogenesis imperfecta deformities and found that HIMEX significantly reduced the number of fractures, presenting lower incidence of migration and higher survival rates than those described in literature. Gomes and Konrath[32] discussed ACL reconstructions in young, skeletally immature athletes, which are potentially harmful, both for the tibial and femoral growth plates. Over the last decade, the results of non-operative treatments have been poor, so that currently some recommend that skeletally immature patients undergo surgery, in spite of its potential risks. Therefore, a consensual decision should be made by parents, athletes and medical teams before other structures of the joint are irreversibly affected. Unku *et al.*[33] performed a retrospective study to describe the effect of multilevel botulinum toxin-A injections in the lower extremities, focusing mainly on gross motor function and functional status in cerebral palsy patients. They claimed that a single multilevel BTX-A injection reduces spasticity and improves motor function in children with cerebral palsy.

Orthopedic evaluation of the upper limb

Eleven articles cover the human upper limb. They dwell on the shoulder, the elbow and the wrist, as well as the rotator cuff and fractures.

The rotator cuff is discussed by three articles. Ramos *et al.*[34] evaluated the results of arthroscopic treatment for rotator cuff tears and concluded that arthroscopic rotator cuff repair provides lower surgical morbidity and intra-articular diagnosis of associated lesions in comparison to open surgery. The benefit of the procedure was confirmed

mainly by pain relief, even in cases of more extensive lesions. Ikemoto *et al.*[35] compared the rotator cuff tendon resistance at the interface tendon-suture using three different sorts of stitches (simple, mattress and modified Mason-Allen) and concluded that although the tendon resistance at the interface tendon-suture was higher using the Modified Mason-Allen stitches than it was when using the Double and Simple Knots, there was no difference in tendon resistance when using the Modified Mason-Allen and Double stitches. On the other hand, they claimed that tendon resistance was higher when using Modified Mason-Allen stitches as compared to tendon resistance when using Simple stitches. Lopes *et al.*[36] compared self-report and interview administration methods using the Western Ontario Rotator Cuff Index and Disabilities of the Arm, Shoulder and Hand Questionnaire in patients with rotator cuff disorders and claimed that there are no differences between the Western Ontario Rotator Cuff Index and Disabilities of the Arm, Shoulder and Hand Questionnaire administration methods with regard to administration time or correlations between the questionnaires.

Fractures are the subject of three articles. Nicolini *et al.*[37] idealized a study to evaluate the preferred treatment methods for the treatment and the angular deviations tolerated in diaphyseal forearm fractures in children and found that among orthopedic surgeons less than 30 years old, the choice for less invasive treatments and greater acceptance of angular values prevailed in both cases. Traumatologists accepted lower angular values and tended towards more invasive treatments. On the other hand, pediatric orthopedic surgeons prefer less invasive treatments and accept greater angular deviations. Morelli *et al.*[38] compared results of the treatment of patients with proximal humerus fractures using two different fixation methods: the t plate (group a) for small segments that provides a relative stabilization is compared to the locking screw plate that promotes a rigid fixation. They concluded that no early or late differences were found between groups in clinical and functional evaluations. In both groups, the prevalence of good results was observed, but the reduction of the anatomical neck angles of the proximal humerus was closer to normal in the blocking screw group. Gandhi *et al.*[39] presented a method of manipulative reduction, immobilization and fixation using Plaster of Paris with the elbow in full extension for the Gartland type III supracondylar fractures which are a common injury in children. They found that the straight-arm treatment of Gartland type III supracondylar fractures appears to be a non-invasive and safe alternative to K-wire fixation.

The creation of a lateral flap was discussed in two papers. Souza *et al.*[40] performed an anatomic study of middle collateral artery, analyzing its frequency, origin and the possibility of using the lateral flap in extended arm with prolonged pedicle in "Y-V" retrograde flow. They concluded that the middle collateral artery was constant and, in most cases, its origin was in the posterior radial collateral artery. Thus, it became feasible to apply the lateral arm flap extended with retrograde blood flow with the longer pedicle.

The three main articulations of the upper limb were the object of one article for each. The elbow was the subject of Gonçalves *et al.*[41], who prospectively evaluated the results obtained in the treatment of patients with cutaneous lesions smaller or equal to 20 cm long by 10 cm wide with the use of lateral arm flap extended distally to the lateral epicondyle of the elbow and found that this lateral arm flap was safe to cover cutaneous lesions of size equal to or smaller than 20 cm long by 10 cm wide, with the extension of the flap up to 8 cm distal to the lateral epicondyle. The shoulder was examined by Almeida-Filho *et al.*[42], who studied the physical properties of polyester thread (ethibond) following methyl methacrylate contact in a biomechanics laboratory. They concluded that methyl metacrylate contact with polyester does not affect its elastic properties and traction resistance. Freitas-Silva *et al.*[43] also compared the prevalence of shoulder-arm morbidity, patient satisfaction with surgery and the quality of life of women submitted to breast-conserving therapy or modified radical mastectomy and immediate breast reconstruction. They claimed that the type of surgery did not affect the occurrence of lymphedema. Breast-conserving therapy, however, increased the risk of shoulder movement limitation. No differences were found between the two surgical techniques with respect to quality of life or satisfaction with surgery. The wrist is covered by Pires-Neto *et al.*[44], who assessed whether a biopsy of the synovia of the carpal tunnel is able to identify systemic diseases that were not diagnosed by clinical examination and laboratory tests, and concluded that such biopsies do not make early diagnosis of potential systemic diseases in patients with carpal tunnel syndrome and add extra costs to the procedure.

Orthopedic evaluation of the vertebral column

Five articles presented data on the vertebral column, four of them covered low back pain and one scoliosis. Ferreira *et al.*[45] endeavored to implement a "Back School" program for low back chronic pain. The obtained data allowed them to conclude that the Back School program was capable of improving the quality of life and functional capacity of the participants. Furtado *et al.*[46] developed a Brazilian version of the gesture behavior test for patients with chronic low back pain, which proved to be a reproducible and valid instrument. In addition, according to the questionnaire results, more disabled patients exhibited more protective gesture behavior related to low back. Maciel *et al.*[47] developed and effectively validated a questionnaire on specific knowledge about low back pain

entitled "The Low Back Pain Knowledge Questionnaire", which proved to be reproducible, valid and sensitive to changes in patient knowledge. França *et al.*[48] contrasted the efficacy of two exercise programs, segmental stabilization and strengthening of abdominal and trunk muscles, on pain, functional disability, and activation of the transversus abdominis muscle in individuals with chronic low back pain and concluded that both techniques lessened pain and reduced disability. Segmental stabilization was superior to superficial strengthening for all variables. Superficial strengthening did not improve TrA activation capacity. Avanzi *et al.*[49] endeavored to identify the predictive radiographic signs of trunk decompensation in King II AIS patients (Lenke B and C) who underwent selective thoracic arthrodesis with third generation material. They concluded that compensatory lumbar curves with similar angular value to the main thoracic curve with greater translation and rotation of the apical vertebra and greater L4 slope had a high probability of trunk decompensation after this surgical treatment. The small number of decompensated patients did not enable any predictive values of these variables to be defined.

Exercise, posture and gait

Exercise is by far the most examined aspect of this triad, with 11 articles dealing with exercise as and end *per se* or as part of procedures to mitigate other pathologies. Secchi *et al.*[50] compared the effect of asymmetric and symmetric swimming strokes on muscle activity of the trunk flexor and extensor muscles in elite speed swimmers. The swimmers were specialists in one of four swimming styles, all without any history of spinal cord injury, and were divided into asymmetric (crawl and backstroke) and symmetric (butterfly and breaststroke) groups. They noted that the asymmetric strokes provided a more efficient muscular response (recruitment) in the trunk flexor muscles, which may be due to the constant maintenance of isometric contraction of the abdominal muscles.

Basyches *et al.*[51] analyzed concentric and eccentric strength and endurance in patients with unilateral intermittent claudication and found that both strength and endurance in the symptomatic leg were lower during concentric compared to eccentric action. Future studies are recommended to investigate the mechanisms underlying these responses and to analyze the effects of interventions to improve concentric strength and endurance on functional limitations in patients with intermittent claudication. Guimarães *et al.*[52] sought to evaluate the neurohormonal activity in heart transplant recipients and compared it with that in heart failure patients and healthy subjects during rest and just after a 6-minute walking test and found that such activity remains increased after the 6-minute walking test after heart transplantation. Sabino *et al.*[53] investigated the impact of nutritional status on body composition, exercise capacity and respiratory muscle strength in severe chronic obstructive pulmonary disease (COPD) patients. They found that severe COPD patients who were overweight or obese had a greater fat-free mass (FFM), exercise capacity and inspiratory muscle strength than patients with the same degree of airflow obstruction who were of normal weight or underweight. They also observed that higher FFM was independently associated with higher exercise capacity. These characteristics of overweight or obese patients might counteract the drawbacks of excess weight and lead to an improved prognosis in COPD. Lacaze *et al.*[54] sought to evaluate musculoskeletal discomfort and mental and physical fatigue in the call-center workers of an airline company before and after a supervised exercise program compared with rest breaks during the work shift. Preliminary results demonstrated that appropriately designed and supervised exercise programs may be more efficient than rest breaks in decreasing discomfort and fatigue levels in call-center operators. Correia *et al.*[55] studied the effect of acute strength exercise and the involvement of small *versus* large muscle mass on the levels of plasma brain-derived neurotrophic factor in healthy individuals. Their data demonstrated that acute strength exercise did not induce significant alterations in the levels of brain-derived neurotrophic factor plasma concentrations in healthy individuals. Considering that its levels may be affected by various factors, such as exercise, these findings suggested that the type of exercise program may be a decisive factor in altering peripheral brain-derived neurotrophic factor. Ackel-D'Elia *et al.*[56] evaluated the occurrence of the well-known predisposing factors and signs and symptoms usually associated with either overreaching or overtraining syndrome in physical fitness centers and concluded that no predisposing factors or signs and symptoms usually associated with either overreaching or overtraining were detected among the members of the studied physical fitness centers. This observation was corroborated by the absence of any significant hematological or stress hormone level alterations in blood analyses of the majority of the selected volunteers. Bocalini *et al.*[57] evaluated the effects of short-term exercise detraining on the functional fitness of older women after a 12-week water-based exercise program and showed that 12 weeks of weekly exercises improve the functional fitness parameters and quality of life of older women. However, after a short detraining period of 4-6 weeks, the neuromuscular parameters and the quality of life score returned to baseline or untrained subject levels. Gurjão *et al.*[58] compared the effects of two intensity programs of resistance training on post-exercise blood pressure response and found that only the higher intensity resistance training can exert a slightly acute hypotensive effect on young females. Gama *et al.*[59] checked whether the variation in time interval between stretching sessions influenced in

flexibility gain and concluded that stretching increased hamstring flexibility, regardless of the time between sessions (24 or 48 hours). Moreover, the interval between the sessions did not influence total flexibility gain. However, with five weekly stretching sessions, flexibility increased more rapidly than it did with three, suggesting that flexibility gain was session-dependent. Ferreira *et al.*[60] evaluated the influence of the level of physical conditioning on the hydration status and the efficiency of the intake of 3 mL of water/kg of body weight to maintain the euhydration of athletes or healthy active individuals. They concluded that the higher level of conditioning allowed a lower hydration status and that, although the hydric loss had not reached critical levels, the strategy of hydration utilizing 3 mL of water/kg of body weight was not sufficient to maintain the subjects here completely euhydrated.

Posture was discussed in seven articles. Cruz *et al.*[61] analyzed the biomechanical characteristics of balance in elderly people, based on pressure center oscillation in five foot positions, carried out with open and closed eyes and conclude that visual feedback materially contributed to posture control. Barsotti *et al.*[62] used fluoroscopic analysis to confirm the rotational movement of the polyethylene insert in rotating platform total knee arthroplasty after a minimum postoperative time of six months and found that the rotation is consistently maintained (93%). This confirmation suggests that the rotating platform effectively has the potential to present lower polyethylene wear due to the higher articulation congruence, compared with fixed support. Alonso *et al.*[63] compared the dislocation of the center of gravity and postural balance in sedentary and recreational soccer players with and without anterior cruciate ligament reconstruction using the Biodex Balance System and the dislocation of the center of gravity and change in postural balance in sedentary individuals. The resutls on the operated limb of Surgery Group were less marked than in the soccer players from the non-surgery group and on the non-operated limbs. The dislocation of the center of gravity and the change in postural balance from the operated limb of the soccer players was less marked than in their non-operated limbs. Lasmar *et al.*[64] evaluated the relative importance of the different static stabilizers of the posterolateral corner of the knee in cadavers and found that the lateral collateral ligament was important in varus stability at 0, 30 and 60 degrees. The popliteofibular complex was the most important structure for external rotation stability at all angles of flexion and was also important for varus stability at 30 and 60 degrees. The posterolateral capsule was important for varus stability at 0 and 30 degrees and for external rotation stability in extension. Level of evidence: Level IV (cadaver study). Ferreira *et al.*[65] estimated the accuracy of postural assessment software for measurement of corporal angles and distances as well as the inter- and intra-rater reliabilities and found unacceptable intraclass correlation coefficient values typically used the vertical line as a reference. This may have increased the inaccuracy of the estimates. Increased accuracies were obtained by younger raters with more sophisticated computer skills, suggesting that past experience influenced results. They concluded that postural assessment software was accurate for measuring corporal angles and distances and should be considered as a reliable tool for postural assessment. Perinetti *et al.*[66] investigated whether malocclusal traits correlate with body posture alterations in young subjects to determine possible clinical applications. Their findings, particularly with regard to the use of posturography as a diagnostic aid for subjects affected by dental malocclusion, did not support existence of clinically relevant correlations between malocclusal traits and body posture. Saura *et al.*[67] analyzed the movement range of the ankle and the vertical ground reaction force involved in gait among diabetic patients with and without peripheral neuropathy. Their data indicated that the range of movement of the tibiotarsal joint is lower in diabetics, regardless of the presence or absence of peripheral neuropathy, and diabetics with peripheral neuropathy showed an increase in the first and second vertical ground reaction force peaks during walking.

Gait is the subject of two articles. Costa *et al.*[68] evaluated the clinical and baropodometric characteristics of the gaits of individuals with a hallux valgus deformity after modified Chevron osteotomy, in isolation or in association with the Weil osteotomy. They concluded that, in the short-term, the modified Chevron technique promoted improvements in clinical conditions and radiographic parameters. The baropodometric evaluation evidenced a load transference from medial to lateral regions of the forefoot, possibly due to the short postoperative period. Moya *et al.*[69] analyzed whether quiet standing posture is related to compensatory postural adjustment and concluded that the motion pattern during compensatory postural adjustment was not related to quiet standing posture or to the final posture of compensatory postural adjustment. This fact should be considered when treating balance disturbances and musculoskeletal abnormalities, since static posture cannot predict how body segments will behave during compensatory postural adjustment.

Animal models

Animal models are presented in a total of 23 articles covering the large variety of problems which can only be properly explored in non-human scenarios. Prominent are the themes of nerve lesions and its regeneration and spinal cord lesions and their treatment. Neto *et al.*[70] reviewed the controversial theme traumatic spinal cord injury treatment by comparing the results of immediate and early (within 1 hour) spinal cord decompression. Their results showed that earlier the decompression of spinal cord

injuries is performed, the better the end results in terms of the function and presence of neurological deficit. Marcon *et al.*[71] evaluated the effects of methylprednisolone used prior to spinal injury, both in relation to possible beneficial effects and to possible associated complications in rats and concluded that the animals treated with methylprednisolone four hours before the injury trauma presented a significantly higher number of deaths than the rats treated with the same drug after the injury. Rodrigues *et al.*[72] standardized an experimental model of spinal cord injury in Wistar rats, through a computerized weight fall impact equipment in rats and claimed that the model demonstrated itself to be effective and capable of generating standard spinal cord injuries. Cristante *et al.*[73] proposed an experimental model for transplantation of fetal cells from the nervous system of Wistar rats to the site of spinal cord injury in adult rats to enable their survival and integration for research protocols that identify other factors of regeneration and functional recovery following spinal cord trauma. They claimed that this study demonstrated the potential use of this research model for use in the transplantation of fetal cells that remain viable two days after their implantation. Polônio *et al.*[74] evaluated the effect of selective electrical stimulation on the structure and function of denervated muscle in mice and found that the selective electrical stimulation was able to temporarily maintain the structure and function of the denervated anterior tibialis muscle. Andraus *et al.*[75] studied the influence of low power GaAs-Al laser irradiation on the regeneration of a peripheral nerve, following a controlled crush injury in rats and found that the procedure accelerated and improved fibular nerve regeneration in rats. Marcolino *et al.*[76] aimed to evaluate the effect of low-intensity laser on functional improvement of the walking of rats after unilateral crushing of the sciatic nerve and concluded that low-intensity laser is effective in accelerating regeneration of the sciatic nerve of rats after crushing. Souza *et al.*[77] evaluated the effect of the neuregulins 1-alpha and 1-beta on the regeneration of the sciatic nerves of male adult C57BL/6J mice using the tubulization technique and claimed that the addition of neuregulins provided a significant increase in the number of myelinized fibers. Malysz *et al.*[78] investigated the effects of treadmill training (10 weeks) on hindlimb motor function and nerve morphometric parameters in diabetic rats submitted to sciatic nerve crush and found that the diabetic condition promoted delay in sciatic nerve regeneration. Treadmill training was able to accelerate hindlimb motor function recovery in diabetic injured rats and prevent or revert morphometric alterations in proximal nerve portions in non-diabetic and diabetic injured rats. Canto *et al.*[79] determined the influence of vertebral posterior elements decortication in bone graft integration in rats and found that decortication accelerated the histologic process of bone graft integration. More production of new bone tissue and predominance of intramembranous type of ossification occurred in the decorticated group. Vaz *et al.*[80] evaluated the efficacy of a centrifuged osteogenic bone marrow aspirate to stimulate healing in rabbit fibular osteotomies and found that the centrifuged osteogenic bone marrow aspirate was able to improve the healing of experimental fibular osteotomies in rabbits. Rossi Junior *et al.*[81] evaluated the osteogenic potential of free periosteum graft in combination with collagen membranes in rats and concluded that nonvascularized periosteal grafts did not show potential to form new bone, and that making the implant 30 days after the creation of the bone defect might have interfered negatively in osteogenic process. Boeloni *et al.*[82] assessed bone site-dependent differences in the effect of thyroid dysfunctions on the femur and lumbar vertebrae of female rats and found that the effect of hypothyroidism and hyperthyroidism on bone histomorphometry is different in each condition and bone site-dependent. Aguiar *et al.*[83] analyzed the mechanical behavior of rat femur proximal thirds submitted to chronic aerobic and resistance training and found that resistance and aerobic training promoted a reduction in the $F_{máx}$ and $DF_{máx}$, respectively. The data showed a different response of both physical training models on the mechanical properties of the rat femurs. Ferreira *et al.*[84] analyzed the effects of exhausting long-duration physical exercise (swimming) sessions of different durations and intensities on the number and phagocytic capacity of macrophages and neutrophils in sedentary rats and found that neutrophils and macrophages of sedentary rats responded differently to exercise-induced stress. Adaptation sessions reduced exercise-induced stress on the immune system. Narayanan *et al.*[85] tested the effects of mobile phone exposure on spatial memory performance in rats and found that such exposure affected the acquisition of learned responses in tested animals. This in turn pointed to the poor spatial navigation and the object place configurations of the phone-exposed animals. Hosseini *et al.*[86] evaluated the effect of L-arginine on the learning and memory of estradiol-treated ovariectomized rats. They proposed that chronic treatment with estradiol enhances the spatial learning and memory of the tested animals, and that long term L-arginine treatment attenuates the effects of improvement produced by estradiol in ovariectomized rats. Romano *et al.*[87] investigated the mechanical properties of deep flexor tendons of rabbits that underwent the tenotomy followed by tenorrhaphy and early application of therapeutic ultrasound with different intensities, in comparison to tendons submitted to tenorrhaphy only and found that therapeutic ultrasound did not improve the mechanical properties of the flexor tendons after repair. Monte-Raso *et al.*[88] reviewed histological and electrophysiological methods for evaluation of peripheral nerve regeneration because they claimed that they did not

faithfully reproduce the functional index of limbs, even in controlled experimental conditions. They described a treadmill with controlled speed for recording footprint of rats submitted to different kinds of sciatic, fibular and tibial nerve lesions. They also described resolved variables that could otherwise obscure proper evaluation of results. Palacio *et al.*[89] evaluated the clinical, biomechanical and histomorphometric effects of zoledronate in the humerus of ovariectomized rats and found that these animals had greater body weight gain than the sham groups. They concluded that Zoledronate had no effect on animals body weight. Groups treated with zoledronate had increased maximum load support and cancellous bone area. Paval *et al.*[90] evaluated the anti-arthritic potential of the plant *Justicia gendarussa* using two different rat models and suggest that the alcoholic extract of *J. gendarussa* exhibited significant anti-arthritic potential. Hajhashemi *et al.*[91] investigated the effect of amitriptyline, a classical tricyclic antidepressant on carrageenan-induced paw edema in rats. They claimed that their results supported the view that amitriptyline has a considerable anti-inflammatory effect on carrageenan-induced paw edema in rats and suggested that at least a part of this property could be mediated through supraspinal sites. Moreover, it seemed unlikely that the investigated adrenergic and opioid receptors played a significant role in this amitriptyline effect. Toscano *et al.*[92] investigated the effect of fetal undernutrition on the passive mechanical properties of skeletal muscle of weaned and young adult rats and found that the increase in passive stiffness in skeletal muscle of weaned rat submitted to intrauterine undernutrition were most likely due to changes in muscle passive stiffness.

The effects of trauma are the object of four investigations. Notable was the similarity of results regarding traffic accidents in Kampala, Uganda and São Paulo, Brazil. Dornelas[93] studied the use of a prosthetic leg and the return to work for amputees by traffic accidents and found that such use was generally for walking and the rate of return to work after rehabilitation was low. Low level of education and work qualifications may have been responsible for these results. Souza *et al.*[94] conducted an epidemiological study of facial fractures in children in an emergency room and found a predominance of males, accounting for 81% of all cases; jaw fracture was the most prevalent, constituting more than 70% of cases; traffic accidents and falls were the etiologic agents that caused the most fractures. Summer was the season with the greatest number of cases of fracture and more than 80% required surgical intervention for their treatment. They suggested that a policy of prevention is necessary, with special attention to traffic accidents and falls. Debieux *et al.*[95] evaluated the profiles of individuals involved in motorcycle accidents, assessing the riders profile, the circumstances of the accidents, injuries, and the use of protective gear. Patients needing only traumatic orthopedic treatment were 16-44 years old, 91% males and the most common mechanism of trauma involved a collision between the motorcycle and another vehicle (67.0%) at speeds between 20-50 km/h (73.0%), involving less experienced riders (67.0%) between 21 and 24 years of age (45%), and in which 53.9% lower limb injuries occurred. Of the injuries, 393 (39.8%) were wounds, 314 (31.8%) were bruises and 212 (21.5%) were fractures [foot, 34 (16%); femur, 32 (15.1%); ankle, 27 (12.7%); tibia, 25 (11.8%)]. Only 6.0% of the riders were not using protective equipment. Increased speed showed a higher rate of fractures. Research on mechanical and traffic engineering, in combination with supervision and awareness-raising of the population, should be considered the most effective methods of prevention. Kamulegeya *et al.*[96] investigated the epidemiological characteristics of maxillofacial fractures and associated fractures in patients seen in the Oral Surgery Unit of Mulago Hospital, Kampala, Uganda. They report a male: female ratio of 7.7:1, the 21-30-year age group as the largest, road traffic accidents contributing 56% of fractures. They proposed that anticipated changes in maxillofacial trauma trends need regular epidemiologic studies of facial fractures to allow the development and implementation of timely novel preventive measures.

Twelve articles defy classification, as the cover themes which are unrelated to general categories and differ amongst themselves. Azi *et al.*[97] determined the elution characteristics of the antibiotic (gentamicin) mixed with bone cement and showed that the mixture released high amounts of the antibiotic in a predictable (therapeutic) manner during at least fourteen days. Yanik *et al.*[98] investigated the effects of obesity and inhaled steroids, as well as the severity and duration of asthma, on osteoporosis in postmenopausal asthma patients as compared to healthy controls. They concluded that there is a slight positive protective effect of high BMI against osteoporosis in asthma patients, but this effect is overcome by time and menopause status. Therefore, the protective effect of obesity against osteoporosis in asthma patients seems to not be significant. Kayalar *et al.*[99] evaluated how bone mineral density in the calcaneus measured by a dual energy x-ray laser correlated with bone mineral density in the spine and hip in Turkish women over 40 years of age, and determined whether calcaneal dual energy x-ray laser variables were associated with clinical risk factors to the same extent as axial bone mineral density measurements obtained using dual energy x-ray absorbtiometry. They found that bone mineral density measurements in the calcaneus using a dual energy x-ray laser are valuable for screening Turkish women over 40 years of age for the risk of osteoporosis. Bispo Júnior and Camargo[100] endeavored to identify prognostic factors related to local recurrence-free survival, metastasis-free survival and overall survival among patients with highly malignant primary osteosarcoma

that was non-metastatic on diagnosis and had poor response to neoadjuvant chemotherapy. They concluded that tumor size greater than 15 cm is an adverse factor for local recurrence-free survival and overall survival but did not influence metastasis-free survival. The osteosarcoma histological type was a significant independent predictor for local recurrence-free survival, metastasis-free survival and overall survival. Santos *et al.*[101] investigated the effectiveness of Samarium153-particulate hydroxyapatite radiation synovectomy in rheumatoid arthritis patients with chronic knee synovitis and conclude that intra-articular injection of Samarium153-particulate hydroxyapatite (15 mCi) with 40 mg of triamcinolone hexacetonide was not superior to triamcinolone hexacetonide alone for the treatment of knee synovitis in patients with rheumatoid arthritis at 1-year follow-up. Lima *et al.*[102] determined the impact of delirium on post-discharge mortality in hospitalized older patients and found that it is a dependent predictor of higher post-discharge mortality. Bitar *et al.*[103] histologically analyzed allografts from cadaveric semitendinous muscle after cryopreservation at -80°C in comparison to a control group kept at only -4°C to test the hypothesis that the histological characteristics of the tissue were maintained when the tendons were kept at lower temperatures. They concluded that semitendinous muscle tendon allografts can be submitted to cryopreservation at -80°C without suffering histological modifications. Demirdal *et al.*[104] investigated the autoantibodies of autoimmune liver diseases in patients with osteoporosis and that the presence of liver membrane antibodies, liver-specific protein, and anti-liver/kidney microsomal autoantibodies has evidenced clues of autoimmune liver diseases in patients with osteoporosis as a secondary risk factor. They emphasized that need for comprehensive studies with a larger sample size and studies designed to compare the results with a normal population to understand the clinical importance of their findings. Yildirim *et al.*[105] compared the efficiency of multiplanar reformatted images and three dimensional images created after multidetector computed tomography examination in detecting acute post-traumatic osseous pathology of the skeletal system and found that dual source multidedector tomography systems trauma patients may be evaluated by multiplanary and three dimensionally reconstructed images. When used correctly, three dimensional imaging is advantageous and can help determine the exact nature and extension and also importance of osseous injuries. Dogan *et al.*[106] note that conflicting results have been reported about the effectiveness of low level laser therapy on musculoskeletal disorders. They investigated the effectiveness of 850-nm gallium arsenide aluminum (Ga-As-Al) laser therapy on pain, range of motion and disability in subacromial impingement syndrome and concluded that the procedure seemed to have no superiority over placebo laser therapy in reducing pain severity, range of motion and functional disability. Souza *et al.*[107] endeavored to verify dental abnormalities and the oral health condition in these patients. They concluded that patients with Hypophosphatemic Rickets frequently presented dental alterations and these were not completely recovered with the treatment (except dental abscess) and that they needed a periodical oral examination. Nerbass[108] studied the effect of massage therapy on sleep quality after cardiopulmonary artery bypass graft surgery and found that pain, stress, anxiety and poor sleep quality may be effectively improved by massage therapy, because it reduces fatigue and improves sleep.

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