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Osteoarthritis: A Review

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Review Article

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ABSTRACT

Osteoarthritis (OA) is a noteworthy wellbeing weight of our time. Age is the most visible chance component for the improvement and action of OA. The robotic have an impact on of maturing on OA has special aspects. On an atomic level, lattice proteins, for example, collagen or proteoglycans are converted, which modifies ligament operate. Collagen pass-connecting within the bone results in disabled pliancy and accelerated stiffness. Synovial or fat tissue, menisci moreover ligaments and muscle groups expect a vital part within the pathogenesis of OA. Within the elderly, sarcopenia or specific reasons for muscle decay are as almost always as possible skilled, prompting a diminished dependability of the joint. Irritation in variety of telephone invasion of synovial tissue or subchondral bone and articulation of incendiary cytokines is increasingly perceived as set off of OA. It has been shown that joint development can show mitigating accessories. In this method physical motion or physiotherapy within the elderly must be energized, likewise so that you could construct the majority. A diminished undeveloped mobile restrict in the elderly is likely linked with an abatement of restore accessories of the musculoskeletal framework. New medication methodologies, for instance with mesenchyme undifferentiated organisms (MSC) are examined, regardless of clear affirmation for his or her efficacy is lackin. The resolution is situated on a history marked by means of joint anguish declined through development, which is able to prompt handicap in exercises of everyday living. Undeniable radiography could support in the selection, yet research middle testing in most cases does no longer. Pharmacologic remedy ought to with acetaminophen and venture as much as non-steroidal calming drugs. Endeavour is a useful subordinate to remedy what's extra, has been gave the impression to shrink soreness and handicap. The dietary supplements glucosamine and chondroitin will also be utilized for moderate to severe knee osteoarthritis when taken in mix. Corticosteroid infusions supply modest, short-term (4 to eight weeks) support of osteoarthritic flare-use of the knee, though hyaluronic corrosive infusions are more costly however can hold up facet result alternate for extra periods. Sufferers with constant torment and dynamic obstacle of daily workout routines despite therapeutic administration maybe the likelihood for surgical procedure.

INTRODUCTION

Osteoarthritis is a sort of joint sickness that outcomes from breakdown of joint ligament and underlying bone. Nearly essentially the most greatly famous side effects are joint agony and solidness. At first, phase effects could arise conveniently after exercise, nonetheless over the longer term may just get to be consistent. Specific indicators might incorporate joint swelling, diminished scope of action, and when the once more is influenced shortcoming or deadness of the legs and arms. Pretty much essentially the most typically integrated joints are those practically the closures of the fingers, on the bottom of the thumb, neck, lessen back, knee, and hips [1-12]. Joints on one part of the body are almost always more influenced than these on the reverse. Mainly the facet

results go forward over years. It might typically influence work and usual day by day workout routines. In no way like detailed sorts of joint inflammation, just the joints are on the whole influenced. Explanations incorporate prior joint damage, irregular joint or appendage progress, and received variables. Hazard is extra extraordinary within the contributors who're chubby, have one leg of a different size, and have employments that end result in large amounts of joint anxiousness. Osteoarthritis is approved to be brought about via mechanical weight on the joint and unhealthy quality incendiary techniques. It creates as ligament is lost and the basic bone will get to be influenced. As agony may just make it tough to see, muscle misfortune could occur ^[13-18]. Diagnosis is generally in view of symptoms and section outcome, with therapeutic imaging and amazing assessments on occasion used to either backing or prevent particular disorders. Versus rheumatoid joint discomfort, which is virtually a provocative, in OA, the joints don't in most cases get to be scorching or crimson. Healing incorporates exercise, endeavours to reduction joint nervousness, care organizations, and soreness prescriptions. Endeavours to abatement joint anxiousness comprise resting and the utilization of a stick. Weight discount may just help in the individuals who're obese. Torment drugs might include paracetamol (acetaminophen) ^[19-28]. On the off risk that these don't mitigate part effects, NSAIDs, for illustration, diclofenac typically utilized, however these options are related with extra noteworthy side results. Opioids if utilized are for virtually probably the most part quite simply prescribed fleeting in view that of the chance of addiction. If torment meddles with natural existence regardless of specific medicinal medications, joint substitution surgical procedure may just offer help. A simulated joint, be that as it can, simply continues going a confined measure of time. Effect for the tremendous majority with osteoarthritis is quality. OA is practically the most greatly famous sort of joint inflammation with sickness of the knee and hip influencing about. Amongst those greater than 60 years of age guys and girls are. Before 45 years historic it can be more normal in men, while following forty five years ancient it is further usual in ladies. It seems to be extra usual in both genders as contributors get to be more headquartered ^[29-35].

SIGNS AND SYMPTOMS

The predominant symptom is discomfort, inflicting loss of potential and customarily stiffness. "Ache" is typically described as a sharp agony or a burning sensation in the related muscle groups and tendons, and is most likely made worse by means of prolonged pastime and relieved by means of relaxation. Stiffness is most normal within the morning, and on the whole lasts not up to thirty minutes after starting everyday hobbies, however could return after periods of state of no activity. OA can intent a crackling noise ^[36-45]. When the affected joint is moved or touched and people could experience muscle spasms and contractions in the tendons. Now and again, the joints can be full of fluid. Some men and women record improved ache related to cold temperature, high humidity, and/or a drop in barometric stress, however stories have had mixed results ^[46-57].

OA often influences the palms, feet, backbone, and the enormous weight-bearing joints, such because the hips and knees, even though in conception, any joint within the physique will also be affected. As OA progresses, the affected joints show up larger, are stiff, painful and could swell, however usually suppose better with tender use however worse with excessive or prolonged use, as a result distinguishing it from rheumatoid arthritis ^[57-61].

In smaller joints, comparable to at the fingers, rough bony enlargements, could form, and though they are not always painful, they do restrict the movement of the fingers enormously. OA on the toes leads to the formation of bunions, rendering them red or swollen. Some individuals discover these bodily changes before they experience any suffering, in part for the reason that the cartilage injury in OA is normally painless considering that cartilage is aneural ^[62-69].

PATHOPHYSIOLOGY

While OA is a degenerative joint infection that may bring about gross ligament misfortune and morphological harm to other joint tissues, more unpretentious biochemical changes happen in the most punctual phases of OA movement. The water substance of solid ligament is finely adjusted by compressive power driving water out and hydrostatic and osmotic weight attracting water. Collagen strands apply the compressive power, though the Gibbs–Donnan impact and ligament proteoglycans make osmotic weight which tends to attract water. Be that as it may, amid onset of OA, the collagen framework turns out to be more muddled and there is a reduction in proteoglycan content inside ligament ^[70-81]. The breakdown of collagen strands results in a net increment in water content. This increment happens in light of the fact that whilst there is a general loss of proteoglycans (and along these lines a diminished osmotic pull), it is exceeded by lost collagen. Without the defensive impacts of the proteoglycans, the collagen filaments of the ligament can get to be powerless to corruption and accordingly fuel the degeneration. Irritation of the synovium (joint cavity lining) and the encompassing joint container can likewise happen, however regularly mellow (contrasted with the synovial aggravation that happens in rheumatoid joint pain) ^[82-85]. This can happen as breakdown items from the ligament are discharged into the synovial space, and the cells coating the

joint endeavor to expel them. Different structures inside the joint can likewise be affected. The ligaments inside the joint get to be thickened and fibrotic and the menisci can get to be harmed and wear away. Menisci can be totally missing when a man experiences a joint substitution. New bone outgrowths, called "goats" or osteophytes, can shape on the edges of the joints, perhaps trying to enhance the compatibility of the articular ligament surfaces without the menisci. The subchondral bone volume increments and turns out to be less mineralized (hypomineralization). All these progressions can bring about issues working. The torment in an osteoarthritic joint has been identified with thickened synovium and subchondral bone sores [86-87].

DIAGNOSIS

X-beams are however the important indicative apparatus nevertheless arthroscopy, ultrasound, MRI, CT evaluation etc are utilized uncommonly for trial concentrates on and not immediate for targets clinical use. Easy radiographs can display joint area narrowing, osteophytes, sclerosis and subchondral radioluscencies. Special elements like emanations, free our bodies, joint association, subluxation, chondrocalcinosis, breakdown seeing that that of avascular putrefaction are moreover taken be conscious. Converted radiographic tactics with larger amplification and resolution could distinguish early subchondral bone versions from the norm by using stereoscope Classification specifications for osteoarthritis of the hip Traditional structure at Hip anguish additionally to no less than two of the accompanying ESR of underneath 20 mm for each and every hour Femoral or acetabular osteophytes on radiographs Joint area narrowing on radiographs (unrivaled, hub as just right as traditional) Classification-Tree design Hip torment additionally to femoral or acetabular osteophytes on radiographs or Hip torment additionally to joint space narrowing on radiographs and anESR of beneath 20 mm for every hour. Characterization standards for idiopathic osteoarthritis of the knee natural configuration Knee torment additionally to osteophytes on radiographs and as a minimum one of the vital accompanying Age over 50 years Morning solidness enduring half-hour or much less Crepitus on movement Classification-Tree function Knee torment and osteophytes on radiographs or Knee torment additionally to sufferer age of forty years or older, Morning firmness enduring beneath half-hour and crepitus on action [88-91]. Order requisites for osteoarthritis of the Hand torment, hurting or firmness additionally to rough tissue progress of two or a greater amount of 10 chose joints Plus Fewer than three swollen meta carpophalangeal joints Plus rough tissue broadening of two or further distal interphalangeal joints or Deformity of two or a higher variety of 10 selected joints. 10 precise joints are 2nd and 1/3 DIP joint, 2nd and 1/three PIP joint and first carpo-metacarpal joint of both palms reconstruction. Radionucleide experiences may respect variations from the norm earlier than radiographic indicators are distinct. Arthrocentesis and lab trying out could distinguish a hidden reason for non-obligatory OA. Determination is made with clever sureness taking into consideration old prior and scientific examination. X-beams might verify the conclusion. The typical alterations visible on X-beam include: joint subject narrowing, subchondral sclerosis (accelerated bone association across the joint), subchondral blister development, and osteophytes. Easy movies would potentially now not relate with the discoveries on bodily examination or with the extent of pain. In most cases other imaging methods is probably not primary to clinically analyze OA [92-94].

TREATMENT

Drugs based treatment

Acetaminophen is regularly viable in osteoarthritis, connected with less antagonistic responses than NSAIDs what's more and is suggested as beginning treatment for osteoarthritis notwithstanding non-pharmacological mediations. Salicylates and customary NSAIDs are viewed as it were for patients who don't acquire sufficient torment alleviation with paracetamol. COX-2 inhibitors can be considered for use due to better gastrointestinadecency. Celecoxib, etoricoxib in the measurement of 60 mg/day and valdecoxib 10 mg/day are as adequate as non-specific NSAIDs in agony help. However late studies are testing the cardiovascular wellbeing of COX-2 inhibitors. Misoprostol as co-treatment in specific patients requiring perpetual NSAIDs treatment may offer assistance to forestall gastric ulcers. Opioids (codeine) and paracetamol in blend give preferred absence of pain over paracetamol alone. Treatment with tramadol results in factually noteworthy and clinically vital and managed change in agony, firmness, physical capacity, worldwide status and rest in patients with endless torment. Tramadol 37.5 mg/Acetaminophen 325 mg mix is likewise successful and alright for treatment of osteoarthritis torment. Topical analgesics (0.025% capsaicin cream what's more, other neighbourhood NSAIDs 1) have been considered suitable as an aide to basic absence of pain, immunotherapy for a solitary symptomatic joint on the other hand for patients who can't endure systemic treatment. The instrument of activity of capsaicin is thought to be through particular incitement of unmyelinated sort C afferent neurons, bringing on the arrival of substance P. Such a discharge reversibly exhausts the store of substance P, a neurotransmitter of fringe torment sensation. When all is said in done, intra-articular corticosteroid infusions are accepted to be best in patients with proof of irritation, radiation, or both. Due to worries over conceivable harmful impacts, normally close to four corticosteroid infusions every year are given in a specific joint. Intra-articular glucocorticoid infusion, bear direct and fleeting lessening in torment. Triamcolone hexacetonide (TH) suspension is a moderately long acting corticosteroid normally utilized for

IA infusion. Patients giving noteworthy aggravation with obvious CPPD gems in joint have better symptomatic alleviation with colchicine [95-97].

Slow drugs for treatment

Some of the slow drugs like Hyaluronic corrosive (HA), Nutraceuticals has regular utilized moderate medication which are utilized as a part of OA TREATMENT. Different medications in this classification are ginger concentrate, which actually contain salicylate and has inhibitory impact on COX and lipooxygenase. So also oral arrangements of avocado and soy unsaponifiables (ASU) have been shown in vitro to restrain IL-6, IL-8, MMPs and stimulate collagen blend. Feline's hook and shark cartilage treatment prompts a change in side effects of OA, as they likewise contain chondroitin sulphate. Most recently another compound (S-Adenosyl methionine), an oxygen radical scrounger has been appeared to lessen torment in OA yet bigger trials are anticipated [98].

Modifying drugs for OA treatment

Tetracycline's are inhibitors of tissue metalloproteinase. This could be because of their capacity to chelate calcium and zinc particles. Minocycline and doxycycline have been appeared to hinder articular ligament collagenase action, forestall proteoglycan cell misfortune, cell demise and affidavit of sort X-collagen grid. Glycosaminoglycan polysulfuric corrosive (GAGPS), known as artemeron, work through decreasing the collagenase action and has indicated promising results. Additionally different specialists like glycosaminoglycan peptide complex (GC-P) known as rumalon has appeared to expand the levels of tissue inhibitors of metalloproteinase, while pentosan polysulfate (cartrofen) hinders granulocyte elastase. Be that as it may, bigger clinical trials have yet to demonstrate their structure altering action. Diancerin and its dynamic metabolite rhein has the ability to repress IL-1 beta in human synovium. It has enhanced agony score in patients of OA and in addition it has been proposed as structure altering drug for OA. In addition sickness adjustment capability of operators like glucosamine, hyaluronan, development components and cytokine control, quality treatment and also chondrocyte and undifferentiated organism transplant needs further assessment [99].

There are various other treatments that involve Different treatments incorporate transcutaneous nerve incitement, nearby back rub, warm modalities, needle therapy, amitriptyline, torment administration advising and care groups. Assistive gadgets in knee osteoarthritis, non-intrusive treatment in structure of knee sleeves, stick or walker and word related treatment are modalities, which can be exceptionally helpful [100].

CONCLUSION

The treatment of OA incorporates an assortment of conceivable non-pharmacological, pharmacological and surgical intercessions. Treatment ought to be custom-made to individual and will comprise of a blend of accessible modalities. There is crucial concurrence on numerous suggestions for OA administration over various social orders making such recommendations. There is not an absence of value rules, yet rather a deficit in spread and execution of the suggestions. Future endeavors ought to concentrate on improving execution in essential consideration settings, where the larger part of OA consideration happens, and in other claim to fame facilities where numerous people are prone to have OA.

REFERENCES

1. Medeiros JM and Rocklin T. Manual Therapy, Therapeutic Exercise, and HipTrac for Patients with Hip Osteoarthritis: A Case Series. *Physiother Rehabil.* 2016;1:108.
2. Lee PYF and Brock J. Intra-articular Injections for Osteoarthritis: From Bench to Bedside, can we Teach Old Drugs New Tricks?. *J Arthritis.* 2016;5: e111.
3. Asadi S. Syndrome Raine, A Rare Autosomal Recessive Dysplasia Sclerotic Osteoarthritis, the First Reports of a New Mutation of Tabriz City in IRAN. *J Genet Syndr Gene Ther.* 2016;7:296.
4. Senatorov VV, et al. Clinical Outcome of Hylan G-F 20 Injections in Shoulder and Hip Osteoarthritis: A Retrospective Review. *J Arthritis.* 2016;5:200.
5. Elmesiry AM, et al. Pentosan Polysulfate as a Disease Modifier of Cartilage Degeneration in Experimental Osteoarthritis. *J Arthritis.* 2016;5:199.
6. Min Oo W and Thae Bo M. Efficacy of Physical Modalities in Knee Osteoarthritis: Recent Recommendations. *Int J Phys Med Rehabil.* 2016;4:e112.
7. Ganguly A. Normalization of Varus/Valgus Deformities in Osteoarthritis by External Application of Phytoconstituents: Confirmed With Anatomical Observations and Biochemical Profiles and Radiological Images. *Anat Physiol.* 2016;6: 224.

8. McSweeney S. First Metatarsophalangeal Joint Osteoarthritis – A Clinical Review. *J Nov Physiother.* 2016;6:293.
9. Ekinci S, et al. A New Treatment Option in Osteoarthritis: Prolotherapy Injections. *J Arthritis.* 2016;5: 197.
10. Tiwari M and Khanna V. In Search of a New Screening Test for Osteoarthritis - Is Urinary Nitrate the Answer? *J Trauma Treat.* 2016;5:297.
11. Nobuta S, et al. Long-term Results of Ulnohumeral Arthroplasty for Symptomatic Elbow Osteoarthritis. *J Arthritis.* 2016;5:196.
12. Shafiaa S, et al. TNF-A, IL-1 β and IL-6 Cytokine Gene Expression in Synovial Fluid of Rheumatoid Arthritis and Osteoarthritis Patients and Their Relationship with Gene Polymorphisms. *Rheumatology (Sunnyvale).* 2016;6:189.
13. Juneja SC, et al. A Less Invasive Approach of Medial Meniscectomy in Rat: A Model to Target Early or Less Severe Human Osteoarthritis. *J Arthritis.* 2016;5:193.
14. Cruz R, et al. The Pig as an Osteoarthritis Translational Research Model. *J Ost Arth.* 2016;1:103.
15. Akhzari M, et al. The Effect of Citrullus Colocynthis on the Reduction of Inflammatory Agents in Osteoarthritis. *Mol Biol.* 2015;4:147.
16. Moss P, et al. Subjects with Knee Osteoarthritis Exhibit Widespread Hyperalgesia to Pressure and Cold. *J Pain Relief.* 2015;4:210.
17. Hiroshi Kawaguchi. Mechanisms of Osteoarthritis from Animal Models. *J Ost Arth.* 2016;1:101.
18. Malemud CJ. The Medical Therapy of Osteoarthritis: “Thinking Outside the Box”. *J Ost Arth.* 2016;1:e101.
19. Hussain S, et al. Efficacy, Tolerability and Adverse Events of Single-Shot Intra-Articular Hyaluronic Acid Injection in Knee Osteoarthritis. *J Trauma Treat.* 2015;4:256.
20. Mohamed Hussein NAM, et al. Effect of Combined Balance and Isotonic Resistive Exercises Versus Isotonic Resistive Exercise alone on Proprioception and Stabilizing Reactions of Quadriceps and Hamstrings and Functional Capacity of Knee Osteoarthritis Patients. *J Nov Physiother.* 2015;5:273.
21. Maryam Mirghiasi S, et al. The Effect of Malva neglecta on the Reduction of Inflammatory agents in Patients with Osteoarthritis. *Mol Biol.* 2015;4:135.
22. Rim D, et al. Therapeutic Features of Medical Care of Knee Osteoarthritis: A Study of 60 Cases . *Int J Phys Med Rehabil.* 2015;3:295.
23. Chou CL and Su YT. Intra-articular Injection for the Management of Rheumatoid Arthritis Patients with Knee Osteoarthritis-Current Evident and Future Prospects. *J Arthritis.* 2015;4:166.
24. Siebert M, et al. Effect of Pharmacological Blocking of TLR-4 on Osteoarthritis in Mice. *J Arthritis.* 2015;4: 164.
25. Aggarwal A and Saibaba B. Emergence of Orthobiologics as a Novel Therapeutic Modality for Osteoarthritis of Knee. *Rheumatology (Sunnyvale).* 2015;5:159.
26. Tanaka R, et al. Are Psychological Factors Associated with Pain Worsening in Individuals with Knee Osteoarthritis? A Systematic Review. *J Nov Physiother.* 2015;5:268.
27. Hussein NA and Sharara GM. Effect of Combined Garlic Therapy and Comprehensive Rehabilitation Program versus Comprehensive Rehabilitation Program Alone on Control of Clinical Manifestations and Quality of Life of Knee Osteoarthritis Patients. *Int J Phys Med Rehabil.* 2015;3:282.
28. Kawaguchi H. Limitations of Human Genetic Studies on Osteoarthritis. *J Arthritis.* 2015;S1: e001.
29. Cantero-Téllez R, et al. Relationship between DASH Questionnaire and Objective Variables in Carpometacarpal Joint Osteoarthritis. *J Arthritis.* 2015;S1:004.
30. Marks R. Impact of Obesity on Complications following Primary Hip Joint Arthroplasty Surgery for Osteoarthritis. *J Arthritis.* 2015;S1:003.
31. Soler Rich R, et al. Treatment of Knee Osteoarthritis with Autologous Expanded Bone Marrow Mesenchymal Stem Cells: 50 Cases Clinical and MRI Results at One Year Follow-Up. *J Stem Cell Res Ther.* 2015;5: 285.
32. Rahmati M and Mozafari M. The Association between Osteoarthritis and Osteoporosis: In Bad Company? *J Osteopor Phys Act.* 2015;3:134.
33. Gandhi R, et al. Gene Expression Profiles of the Subcutaneous Fat and Infrapatellar Fatpad in Individuals with Early and Endstage Knee Osteoarthritis: A Cross-sectional Analysis. *J Arthritis.* 2015;S1:002.
34. Erfani T, Keefe F, et al. Psychological Factors and Pain Exacerbation in Knee Osteoarthritis: A Web Based Case-Crossover Study. *Rheumatology (Sunnyvale).* 2015;S6:005.
35. Panda AK. Ayurveda Treatment Outcomes for Osteoarthritis. *J Homeop Ayurv Med.* 2015;3: e115.
36. Ibrahim SE, Zohiery AK, et al. Acupuncture versus Homeopathy as a Complementary Therapy in Patients with Knee Osteoarthritis. *Int J Phys Med Rehabil.* 2015;3:259.
37. Seyni SB, et al. Results and Survival at Mid-term Follow-up of a Series of 15 High Tibial Lateral Closing Wedge Osteotomies in the Treatment of Unicompartmental Medial Osteoarthritis. *J Trauma Treat.* 2015;4: 234.
38. Bandyopadhyay SK. *Journal of Global Research in Computer Science.* 2011;2:4.
39. Unyo C, et al. Total Hip Replacement Improves Aerobic Capacity in Osteoarthritis Patients: A Prospective Experimental Study. *Int J Phys Med Rehabil.* 2015;3:251.

- 40.Hicks Little CA. Whole Body Vibration as a Physiotherapy Tool for Post-Traumatic Knee Osteoarthritis Patients: A Commentary. *J Nov Physiother.* 2014;4:230.
- 41.Liu C. Recombinant Progranulin Prevents the Loss of Proteoglycan in Surgically Induced Osteoarthritis Model. *J Cytol Histol.* 2014;5:6.
- 42.Centeno CJ, et al. Efficacy and Safety of Bone Marrow Concentrate for Osteoarthritis of the Hip; Treatment Registry Results for 196 Patients. *J Stem Cell Res Ther.* 2014;4:242.
- 43.Hatoum HT, et al. Assessment of the Health-Related Quality of Life Impact of EUFLEXXA® (1% Sodium Hyaluronate) Using Short Form 36 (SF-36) Data Collected in a Randomized Clinical Trial Evaluating Treatment of Osteoarthritis Knee Pain. *Pharm Anal Acta.* 2014;5:313.
- 44.Mabey T and Honsawek S. Genome Wide Association Studies and Next Generation Sequencing Technologies in Osteoarthritis. *Next Gen Seq Applic.* 2014;1:108.
- 45.Coskun NC and Benlidayi IC. Non-Pharmacological Management of Hand Osteoarthritis: From A Perspective of Physiatry. *J Arthritis.* 2014;3:141.
- 46.Marks R. Depression and Osteoarthritis: Impact on Disability. *Aging Sci.* 2014;2:126.
- 47.De Souza Tesch R, et al. Cell Therapies in the Treatment of Temporomandibular Osteoarthritis: A Systematic Review of the Literature. *J Interdiscipl Med Dent Sci.* 2014;2:136.
- 48.Bayram B, et al. HLA-B27 Allele Frequency in a Turkish Study Population with Primary Osteoarthritis. *J Primatol.* 2014;3:117.
- 49.Danesch U, et al. NEM® Brand Eggshell Membrane Effective in the Treatment of Pain Associated with Knee and Hip Osteoarthritis: Results from a Six Center, Open Label German Clinical Study. *J Arthritis.* 2014;3:136.
- 50.Rother M, et al. Meta-Analysis of Randomized Clinical Trials Investigating the Effect of TDT 064, a Gel-Based Formulation Containing Ultra-Deformable Phospholipid Vesicles, in Patients with Knee Osteoarthritis. *Rheumatology (Sunnyvale).* 2014;4:138.
- 51.Churchill LK and Bryant D. The Waiting Game: A Primary Care Intervention to Improve Access to Specialist Care to Patients with Osteoarthritis. *Orthopedic Muscul Syst.* 2014;3:158.
- 52.Murphy J and Levine B. Modern Arthroplasty Treatment Options for Osteoarthritis of the Knee. *Orthopedic Muscul Syst.* 2014;3:152.
- 53.Hacken B, et al. The Effects of Bariatric Surgery Weight Loss on Knee Pain in Patients with Knee Osteoarthritis: 2 Year Follow-up. *J Arthritis.* 2014;3:132.
- 54.Yakobov E, et al. Validation of the Injustice Experiences Questionnaire adapted for Use with Patients with Severe Osteoarthritis of the Knee. *J Arthritis.* 2014;3:130.
- 55.Liou IH, et al. Intraarticular Botulinum Toxin A for the Treatment of Painful Ankle Osteoarthritis-A Pilot Study. *J Arthritis.* 2014;3:1000127.
- 56.Jick S and Li L. Risk of Osteonecrosis among Persons with Osteoarthritis of the Knee: Findings from the UK based General Practice Research Database. *Orthopedic Muscul Syst.* 2014;S2:S2-002.
- 57.Hussein NA and Thomas M. Modified Cardiac Rehabilitation for Obese Patient with Severe Bilateral Knee Osteoarthritis. *J Clin Exp Cardiol.* 2014;5:303.
- 58.Paradowski PT. Osteoarthritis of the Knee: Assessing the Disease. *Health Care Current Reviews.* 2014;2:e103.
- 59.Huang TW, et al. The Computer-Aided-Surgery Improved the Accuracy of Femoral Component Rotation in Total Knee Arthroplasty for the Advanced Osteoarthritis with Valgus Deformity. *J Arthritis.* 2014;3:118.
- 60.Yonezu H. Total Knee Arthroplasty in Patients with Osteoarthritis of the Knee Joint Secondary to the Contralateral Hip Disorder. *Orthop Muscul Syst.* 2014;3:143.
- 61.Valdes K. Researching the Effectiveness of Therapeutic Interventions for Carpometacarpal Osteoarthritis. *J Yoga Phys Ther.* 2014;4:153.
- 62.Abate M. Hyaluronic Acid and Platelet Rich Plasma in Hip Osteoarthritis: Work in Progress. *Surgery Curr Res.* 2013;3:e110.
- 63.Drexler M, et al. A Non- Invasive Foot-Worn Biomechanical Device for Patients with Hip Osteoarthritis. *Surgery Curr Res.* 2013;3:153.
- 64.Dionisio VC. Neural Mechanisms and Perspectives about the Therapeutic Exercises for Knee Osteoarthritis. *J Yoga Phys Ther.* 2013;3:146.
- 65.Gobbi A, et al. Is there any Role for Pulsed Electromagnetic Fields in the Treatment of Early Osteoarthritis of the Knee? *J Osteopor Phys Act.* 2013;1:106.
- 66.Machon V, et al. Platelet-Rich Plasma in Temporomandibular Joint Osteoarthritis Therapy: A 3-Month Follow-Up Pilot Study. *J Arthritis.* 2013;2:112.
- 67.Marks R. Anxiety in Disabling Osteoarthritis: Implications for Research and Practice. *Aging Sci.* 2013;1:e105.
- 68.McGrath A, et al. A Comparison of Intra-Articular Hyaluronic Acid Competitors in the Treatment of Mild to Moderate Knee Osteoarthritis. *J Arthritis.* 2013;2:108.

69. Archavlis E, et al. Preliminary Results of Minimally Invasive Decompression, TLIF and Percutaneous Pedicle Screw Insertion in Stenotic Spondylolisthesis with Severe Facet Joint Osteoarthritis. *J Spine*. 2013;S5:004.
70. Jayasuriya CT and Chen Q. Role of Inflammation in Osteoarthritis. *Rheumatol Curr Res*. 2013;3:121.
71. Coriolano K, et al. Functional and Physiological Determinants of Perceived Disability in Individuals Diagnosed with Osteoarthritis of the Hip. *Int J Phys Med Rehabil*. 2013;1:153.
72. Vu L, et al. Outcomes of Osteoarthritis after Bariatric Surgery. *Surgery Curr Res*. 2013;3:141.
73. Kondo K, et al. Association between Dietary Habits and Knee Osteoarthritis in Japanese Older Adults: A Cross-Sectional Study. *Orthop Muscul Syst*. 2013;2:120.
74. Coriolano K, et al. Changes in Knee Pain, Perceived Need for Surgery, Physical Function and Quality of Life after Dietary Weight Loss in Obese Women Diagnosed with Knee Osteoarthritis. *J Obes Weight Loss Ther*. 2013;3:174.
75. Vernon H. Manipulation/Manual Therapy in the Treatment of Osteoarthritis. *J Arthritis*. 2013;2:e107.
76. Clement ND. Is Osteoarthritis of the Knee Hereditary? A Review of the Literature. *Hereditary Genetics*. 2013;S1:004.
77. Gbiri CA, et al. Comparative Efficacy of Openchain and Close-chain Kinematics on Proprioception, Muscles' Strength and Functional Performances in Individual with Knee Osteoarthritis. *Occup Med Health Aff*. 2013;1:104.
78. Wei X, et al. The Function Role of SDF-1/CXCR4 Signaling in Osteoarthritis. *Rheumatol Curr Res*. 2012;2:e111.
79. Savitskaya YA, et al. Identification of Circulating Natural Antibodies against Endogenous Mediators in the Peripheral Blood Sera of Patients with Osteoarthritis of the Knee: A New Diagnostic Frontier. *J Mol Biomark Diagn*. 2012;3:135.
80. Rao K, et al. Can Telerehabilitation Add a New Dimension in the Treatment of Osteoarthritis Knee? *J Pain Relief*. 2012;2: 113.
81. Kosuwon W, et al. Determination of Cartilage Volume Using MRI in Patients with Knee Osteoarthritis: Efficacy Study of 25 Milligrams of Sodium Hyaluronate (2.5 MI) Versus Placebo. *Clin Exp Pharmacol*. 2012;2:112.
82. Liu JX, et al. The Effect of Laparoscopic Adjustable Gastric Banding on Osteoarthritis and other Obesity-Related Comorbidities. *J Obes Wt Loss Ther*. 2012;2:138.
83. Ebnezar J and Yogitha B. Effectiveness of Yoga Therapy with the Therapeutic Exercises on Walking Pain, Tenderness, Early Morning Stiffness and Disability in Osteoarthritis of the Knee Joint - A Comparative Study. *J Yoga Phys Ther*. 2012;2:114.
84. Dealy CN. Chondrogenic Progenitors for Cartilage Repair and Osteoarthritis Treatment. *Rheumatology*. 2012;S3:e001.
85. Fisher MC, et al. The Potential of Human Embryonic Stem Cells for Articular Cartilage Repair and Osteoarthritis Treatment. *Rheumatol Curr Res*. 2012;S3:004.
86. Di Lorenzo. Intra-Articular Treatments Horizons in Osteoarthritis. *J Arthritis*. 2012;1:e101.
87. Cucchiari M. The Burden of Human Osteoarthritis: Cell and Gene-Based Therapies on the Horizon? *Orthopedic Muscul Sys*. 2012;1:e103.
88. Yuan Z And Jiang H. Recent Advances in Diffuse Optical Imaging of Osteoarthritis. *J Biochip Tissue chip*. 2012;2:e110.
89. Yazdanpanah P, et al. Relative Risk of Knee Osteoarthritis in Women Carpet Weavers and Non-Carpet Weavers. *Gynecol Obstetric*. 2012;2:113.
90. Al-Jarallah K, et al. Giant Cell Tumor of Tendon Sheath Mimicking Nodal Osteoarthritis. *J Arthritis*. 2012;1:103.
91. Gabay O. Osteoarthritis: New Perspectives. *J Spine*. 2012;1:e101.
92. Martocchia A, et al. Association of Severity of Osteoarthritis and Carotid Atherosclerosis in Patients with Metabolic Syndrome. *Rheumatology*. 2011;1:105.
93. Martocchia A, et al. Association of Severity of Osteoarthritis and Carotid Atherosclerosis in Patients with Metabolic Syndrome. *Rheumatology*. 2011;1:105.
94. Carrega G, et al. Role of Nuclear Imaging and Intraoperative Frozen Section in Patients with Late Prosthetic Joint Infections. *J Med Diagn Meth*. 2013;2:124.
95. Kofteridis DP, et al. Delayed-Onset Mycobacterium tuberculosis Prosthetic Joint Infection after Hip Hemiarthroplasty: A Case Report and Review of the Literature. *Clin Microbial*. 2013;2:114.
96. Peel TN, et al. Culture Negative Prosthetic Joint Infection—A Description of Current Treatment and Outcomes. *Clin Microbial*. 2013;2:106.
97. Brettfeld C, et al. Integration and Weighing of Omics Data for Obesity. *J Diabetes Metab*. 2016;7:690.
98. Szybinski Z. Primary Prevention of Obesity and Type 2 Diabetes Mellitus. *Epidemiology (Sunnyvale)*. 2016;6:243.
99. Dejan S. Determination of the Carpal Unstability in Patients with Rheumatoid Arthritis. *Interdiscip J Microinflammation*. 2015;3:132.

100. Madhavi K, et al. Preparation, Optimization and Characterization of Eudragit Coated Chitosan Piroxicam Microspheres Intended for the Treatment of Rheumatoid Arthritis. Pharm Anal Acta. 2016;7:485.