ANNUAL CLINICAL REPORT 16

SPORTS MEDICINE

Changi General Hospital

CHANGI SPORTS MEDICINE CENTRE
CHANGI GENERAL HOSPITAL
recovery and beyond

Singapore Sports Medicine Centre

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CONTENTS

WHAT WE DO

Established in 2003, Changi General Hospital (CGH)'s Sports Medicine department operates Changi Sports Medicine Centre (CSMC) and Singapore Sports Medicine Centre (SSMC), with the aim of providing an integrated, multidisciplinary Sports Medicine care that is quality-assured, affordable and accessible. Both centres offer a comprehensive approach in sports injury treatment and prevention, performance enhancement and weight management under one roof.

(TOP) Singapore Sports Medicine Centre
(BOTTOM) Changi Sports Medicine Centre

SPORTS MEDICINE DEPARTMENT

NO. OF OUTPATIENT ATTENDANCE & TREATMENT

Changi Sports Medicine Centre (CSMC)

SPORTS MEDICINE CONSULTATION

2015	12,502
2016	12,926

VISCOSUPPLEMENTATION

2015	266
2016	297

ATHLETE PRE-PARTICIPATION MEDICAL SCREENING

2015	585
2016	613

AUTOLOGOUS CONDITIONED PLASMA INJECTION

2015	31
2016	14

Singapore Sports Medicine Centre (SSMC)

SPORTS MEDICINE CONSULTATION

2015	2,983
2016	2,780

VISCOSUPPLEMENTATION

2015	49
2016	51

AUTOLOGOUS CONDITIONED PLASMA INJECTION

2015	8
2016	10

QUALITY AND TIMELINESS TO CARE

PROPORTION OF PATIENTS SEEN BY A SPORTS MEDICINE SPECIALIST ON FIRST VISIT

Changi Sports Medicine Centre*

2015	66%
2016	60%

Singapore Sports Medicine Centre

2015	100%
2016	100%

CGH's target for the proportion of patients seen by a Specialist on the first visit to the Specialist Outpatient Clinic is 60%. CSMC met the target in both 2015 and 2016.

As SSMC is a private clinic, only Physicians recognized as a Specialist provide consultation at the clinic.

SPORTS MEDICINE CONSULTATION APPOINTMENT LEAD TIME

PRIVATE APPOINTMENT LEAD TIME (AVERAGE)

CSMC 2015	17 Days
CSMC 2016	10 Days
Overall CGH SOC 2016	15 Days

SUBSIDISED APPOINTMENT LEAD TIME (AVERAGE)

CSMC 2015	18 Days
CSMC 2016	13 Days
Overall CGH SOC 2016	44 Days

CSMC's average Sports Medicine consultation appointment lead time for both private and subsidized patients in 2016 is shorter compared to 2015. The average appointment lead time in 2016 is also shorter compared to the overall CGH Specialist Outpatient Clinics (SOC). An improvement in timeliness to care will lead to better management and outcome for the patients.

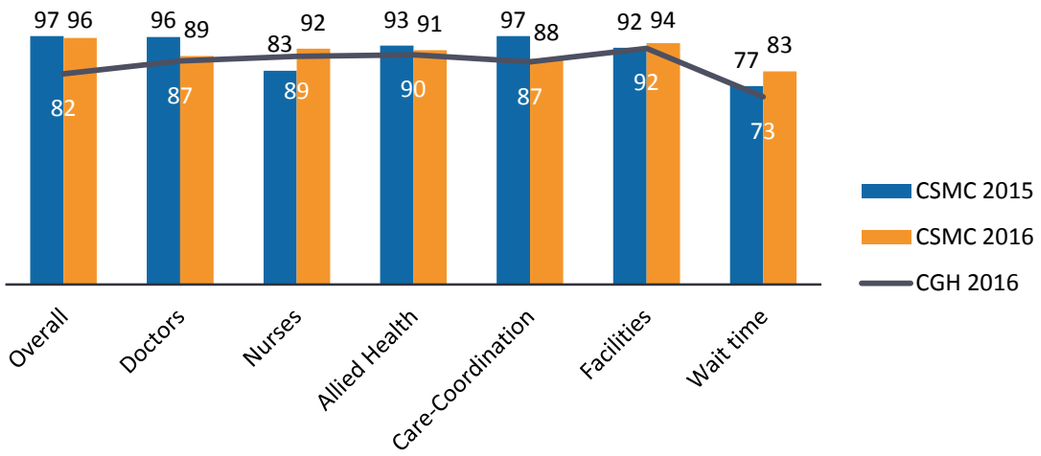
**The Sports Medicine department has a special Sports Medicine Practitioner Scheme (SMPS). Graduates of the scheme will have the competencies of an Associate Consultant and above.*

PATIENT EXPERIENCE

Changi General Hospital's mission is 'To Deliver the Best Patient Care with Passion and Empathy'. We are committed to give our best every day so that we deliver the best outcome possible.

CGH conducts an Internal Patient Satisfaction Survey (IPSS) to better understand how care is delivered from the patients' perspective. We know that the patient experience goes well beyond patient satisfaction surveys. Nonetheless, patient surveys are an important tool for us to identify opportunities to improve how we deliver care.

CGH internal patient satisfaction survey score



Changi Sports Medicine Centre's overall IPSS score in 2016 is 96.0, slightly lower than the previous year's score of 96.7. CSMC's overall IPSS score is the highest amongst all the Specialist Outpatient Clinics in CGH, which averages at 82.1.

2016

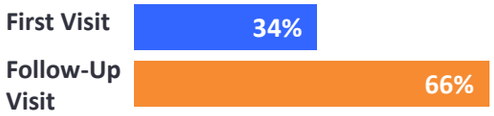
Changi Sports Medicine Centre was awarded the CGH STAR Achievement Award, which recognises excellent performance in the 2016 Internal Patient Satisfaction Survey and achievement of consistently good patient feedback in the past 12 months.

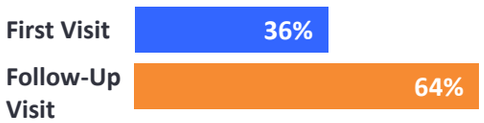
This is a great encouragement and affirmation that the team is on the right track.

CONTINUITY OF CARE

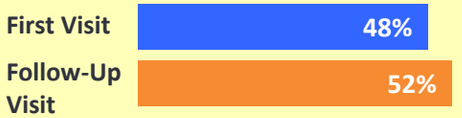
PROPORTION OF FIRST AND FOLLOW-UP SPORTS MEDICINE CONSULTATION VISIT

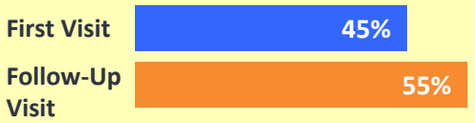
Changi Sports Medicine Centre





Singapore Sports Medicine Centre





CLINICAL OUTCOME & PATIENT SAFETY

AUTOLOGOUS CONDITIONED PLASMA

Autologous conditioned plasma (ACP) is a method of concentrating platelets and growth factors from patient's own blood. The increased concentration of growth factors may facilitate signalling and recruitment of cells to the injury site, and if successful, may improve the environment for healing.

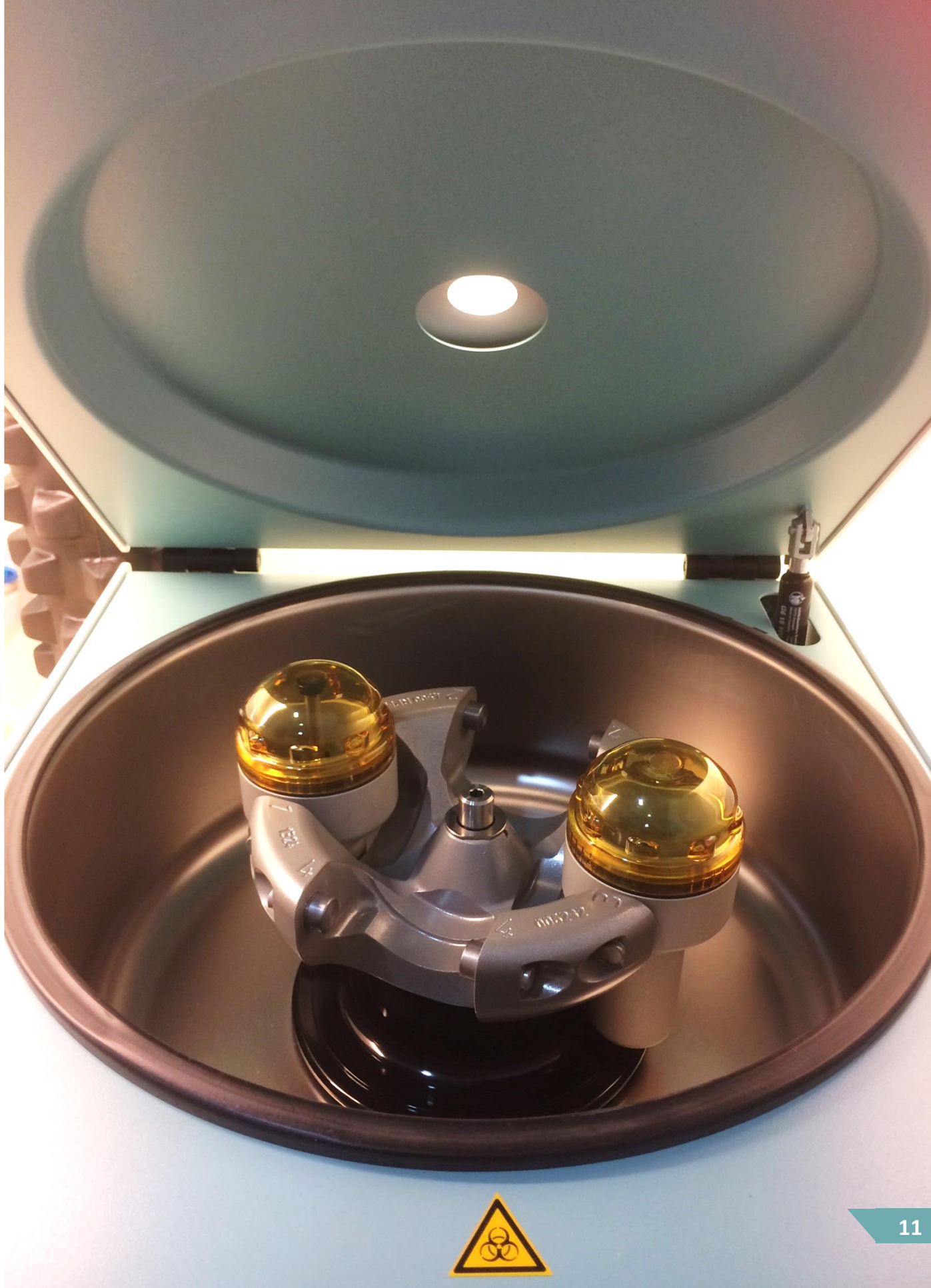
ACP is not regarded as a first line or standard treatment, and currently has low scientific evidence of its treatment efficacy. Therefore it may be provided only if all other conventional and sound evidence-based treatments have been attempted and have not been shown to produce the desired outcomes.

The accepted indications, which are subject to revisions by the Ministry of Health, for this procedure are:

- Non-surgical treatment of acute muscle and ligament injuries; and
- Biological augmentation of acute Achilles tendon repairs.

Changi Sports Medicine Centre and Singapore Sports Medicine Centre have made this procedure available to patients since January 2012. We use the closed double syringe system by Arthrex. 15ml of patient's blood is drawn and centrifuged at 1500 rpm for 5 minutes. Approximately 3ml of ACP is extracted and injected into the target area under sterile technique and ultrasound guidance.

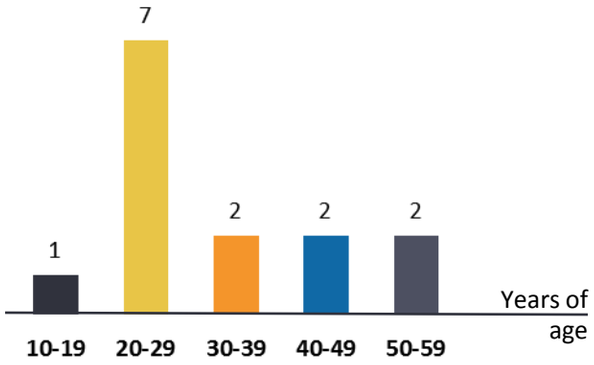
Potential risks involved in this procedure were explained to patients beforehand - pain, bleeding, bruising and swelling at site of obtaining blood or injection site. There is very low risk of specimen error as blood drawn is processed and immediately injected in the treatment room, and centrifuge only allows 1 blood specimen to be processed at any time. As it is a closed system, there is little risk of blood product contamination.



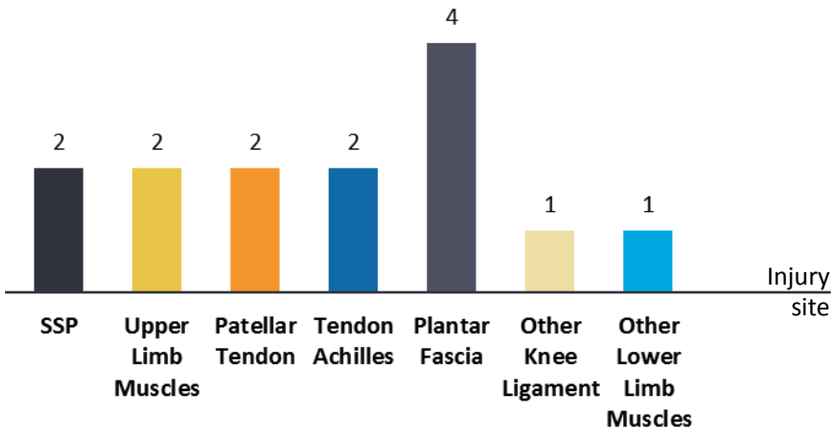
ANNUAL AUDIT FOR AUTOLOGOUS CONDITIONED PLASMA

Yearly audits are done for ACP injections performed. In 2016, 14 ACP injections were performed in 3 female and 11 male patients. No complication was observed in any of the cases. 2 patients were lost to follow up.

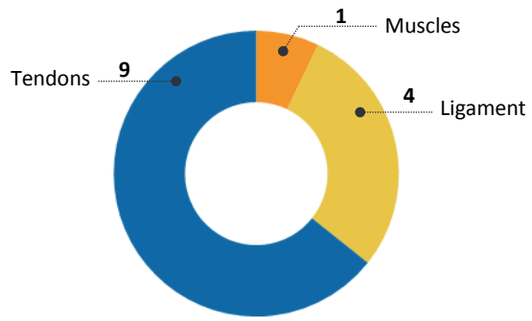
Number of patients based on age group



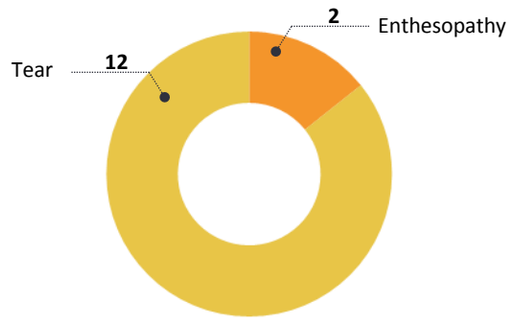
Number of patients based on injury site



Injury structure

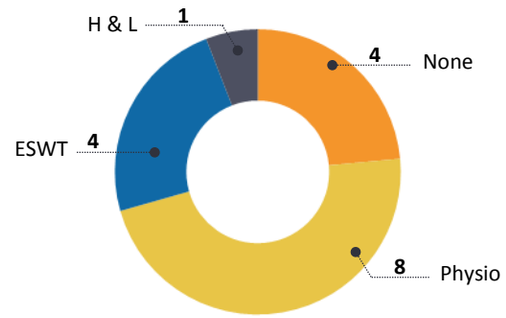


Types of injury

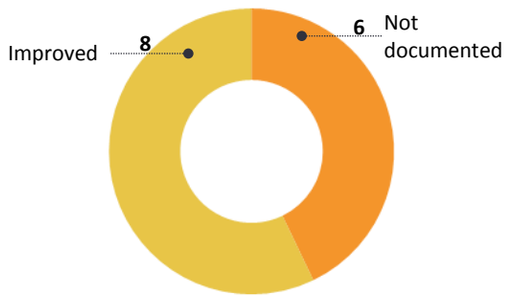


7 patients had concomitant injuries; the other 7 patients had none.

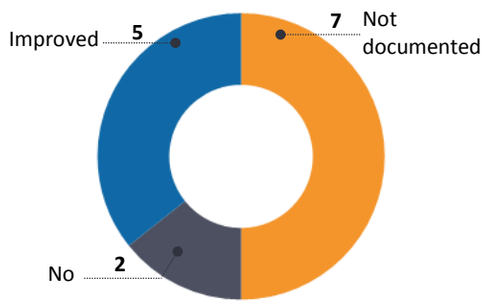
Other treatments



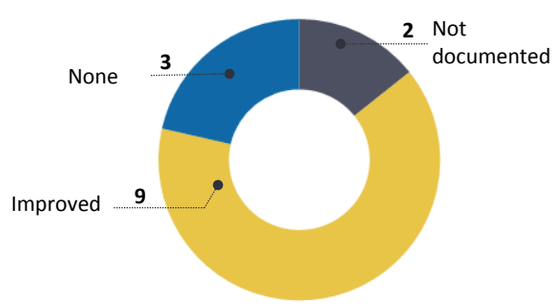
Ultrasound findings changes



Improvements in pain score



Improvements in symptoms



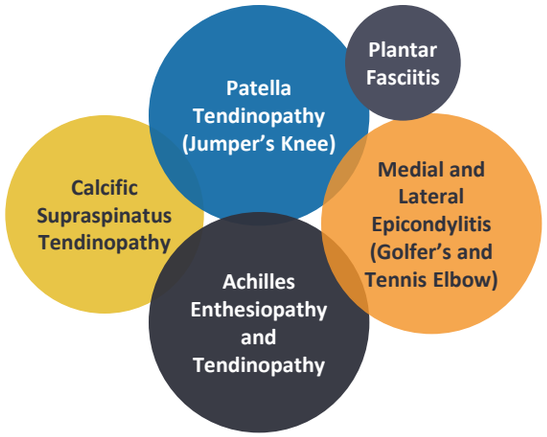
EXTRACORPOREAL SHOCK WAVE THERAPY

Ultrasound-Guided Focal Extracorporeal Shock Wave Therapy (ESWT) is a non-invasive method of treating specific soft tissue injuries. It has been used in Germany and other parts of the world since the early 1990s.

ESWT evolved from Extracorporeal Shockwave Lithotripsy (ESWL), where shock waves are used to break down kidney stones. A shock wave is a pulsed wave that delivers a sudden high pressure to a targeted area, followed by a negative pressure. Extracorporeal means that the shock wave is delivered from outside the body.

In ESWT, lower energy levels are used in specific musculoskeletal conditions to trigger an individual's own repair mechanisms. In CSMC, we use focal shock waves that are accurately guided by ultrasonography onto the offending lesion.

Indications for ESWT



Injury healing mechanisms by ESWT

Based on current knowledge, it is thought that the shock waves:

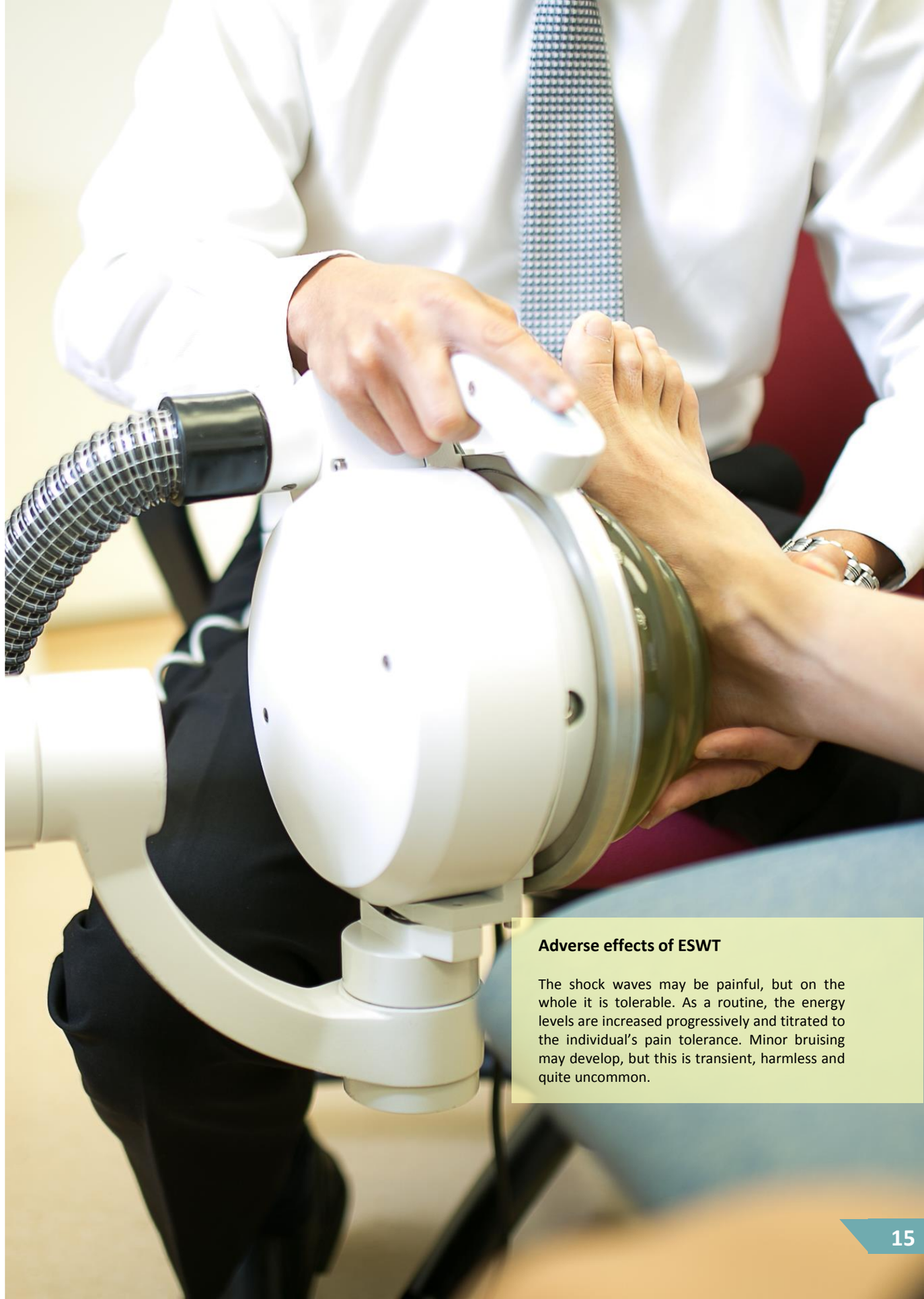
- Trigger the body's repair mechanism through the local release of various growth factors. As a result, the recovery and pain relief is felt progressively by patients over the next 3 to 6 months.
- Over-stimulate pain transmission nerves leading to an immediate reduction in pain and sensitivity.

What does the treatment involve?

The course of treatment involves 2 outpatient sessions that are usually spaced 1 week apart. Prior to the procedure, the severity of condition will be assessed by the Physician using the visual analogue scale (VAS) which measures pain on a scale from 0 to 10 (0 = no pain at all, 10 = most severe pain).

During each session, an ultrasound scanner is used to visualise the lesion on the painful area and accurately guide the shock wave emitter to the injury site. All treatments are given using the Dornier MedTech EPOS (Extracorporeal Pain Therapy and Orthopaedics System) Ultra (Dornier MedTech America Inc, Kennesaw, Ga) based on a standardized protocol. About 2000 shock waves will then be delivered to the lesion under ultrasound-guidance in increasing energy levels over a 10-minute duration. The patient may resume normal daily activities immediately after each treatment. Aggravating activities however, should be avoided until 2 weeks or more after the second ESWT session.

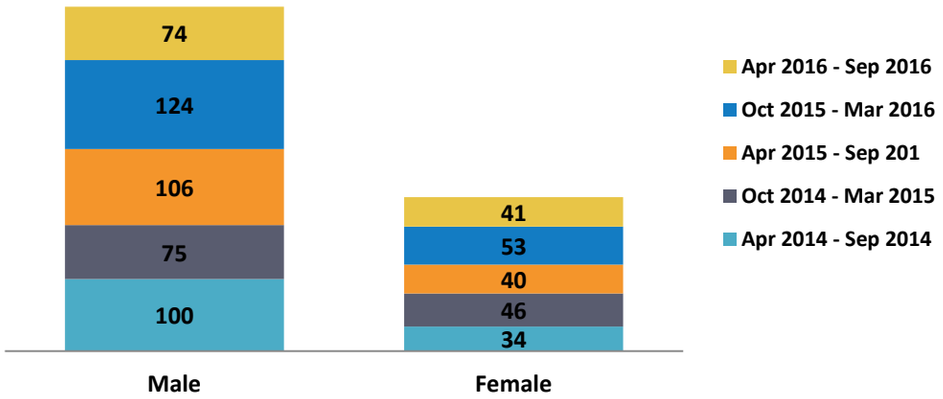
Concurrent therapy (eg. physiotherapy) and podiatry review for orthotics may be prescribed to address the underlying biomechanical cause of the injury. The patient is usually reviewed by the Physician within 2 to 4 weeks post-second ESWT session, and subsequently 3 to 6 months thereafter for any adverse effects and return to sports.



Adverse effects of ESWT

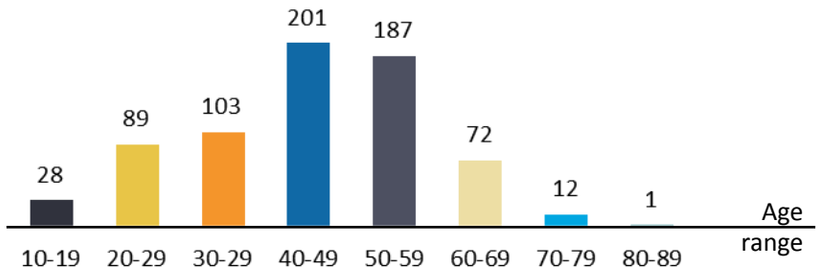
The shock waves may be painful, but on the whole it is tolerable. As a routine, the energy levels are increased progressively and titrated to the individual's pain tolerance. Minor bruising may develop, but this is transient, harmless and quite uncommon.

Gender breakdown of patients treated in 30 months (Apr 2014- Sep 2016)



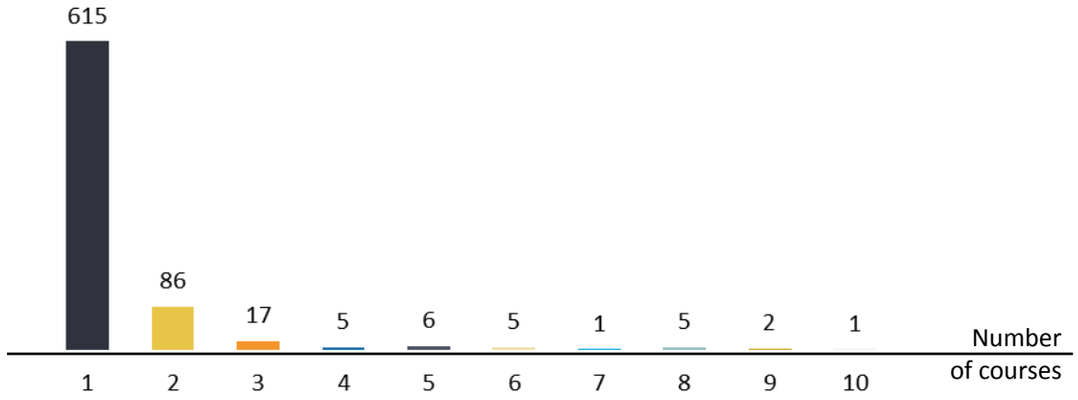
The number of patients who have received ESWT within the past 30 months and the gender proportion have been relatively similar.

Age groups of patients treated in 30 months (Apr 2014- Sep 2016)



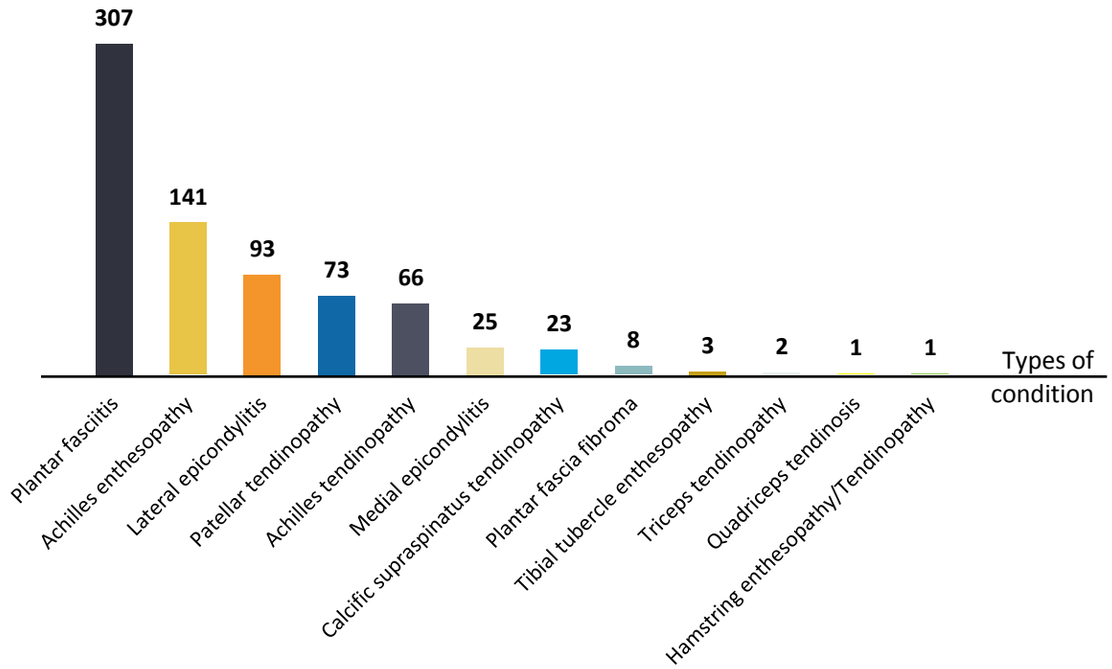
The majority of these patients were between 40 to 59 years old.

Total number of ESWT courses received by patients in 30 months (Apr 2014 – Sep 2016)



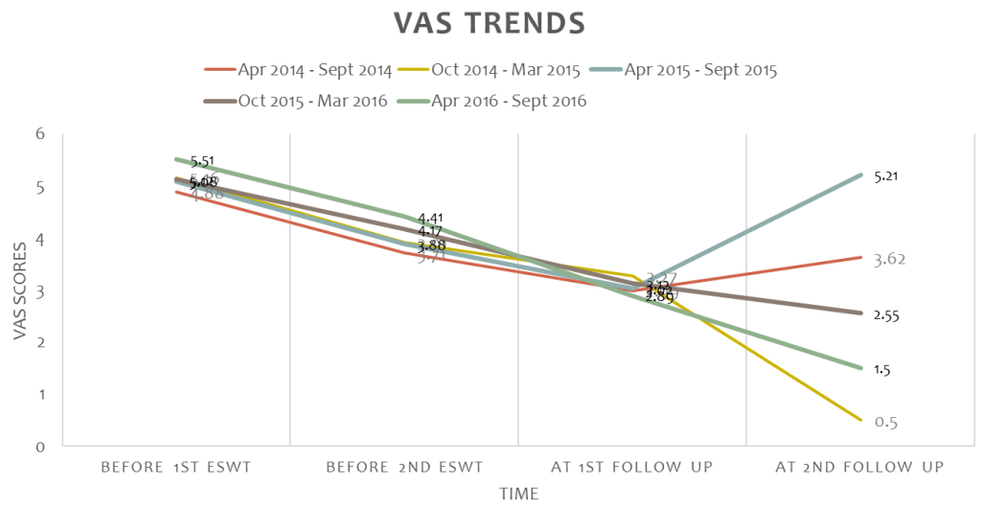
Most of these patients were receiving their first course of ESWT for their condition.

Conditions treated by ESWT within past 30 months (Apr 2014 – Sep 2016)



The main musculoskeletal condition that was treated with ESWT within the past 30 months is Plantar Fasciitis followed by Achilles Enthesopathy, and this is consistent with the recommendations and indications for the procedure.

Pain Score



There is a general improvement in the pain score reported by the patients treated with ESWT. However, with many patients defaulting the second follow up session scheduled between 3 to 6 months post-treatment, the mean VAS scores documented at the second follow up appear raised. Many of these patients did not attend the second follow up sessions as they were already pain free and had resumed sports by the first follow up session that was scheduled 2 to 4 weeks post-treatment.

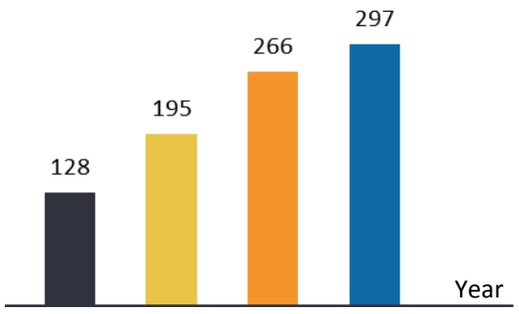
VISCOSUPPLEMENTATION

Viscosupplementation consists of injection of exogenous hyaluronic acid into articulating joints, with the objective of restoring the rheological properties of the synovial fluid, hence producing, analgesic, anti-inflammatory, mechanical and chondroprotective effects[1].

In Changi Sports Medicine Centre (CSMC), viscosupplementation is offered mainly to those with knee osteoarthritis (99.6%), but other indications include those with hip or ankle osteoarthritis and chondromalacia patella.

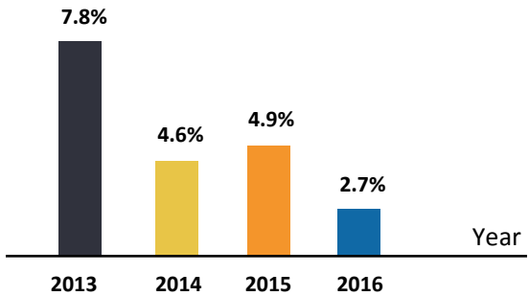
Different viscosupplementation are used in CMSC, including Synvisc® One™, Monovisc®, Arthromac®, and Synolis- VA. They are mainly derived from two methods, either from extraction and purification from rooster coombs, or purified biological fermentation from bacterial culture[2, 3]. Synvisc® One™ is made from the former.

Total viscosupplementation performed at CSMC and SSMC



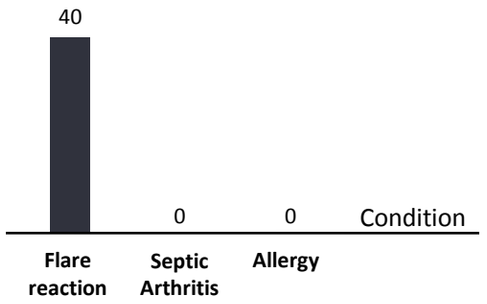
Viscosupplementation is done as an outpatient procedure and is generally well tolerated. The total number of viscosupplementation done in CSMC and Singapore Sports Medicine Centre from 2013 to 2016 is recorded at 886. We see that the uptake is on a steady increase since 2013.

Incidence rate of adverse effects in CSMC and SSMC combined



Despite the increase in uptake of viscosupplementation, we see an overall downward trend of incidence rate of adverse effects.

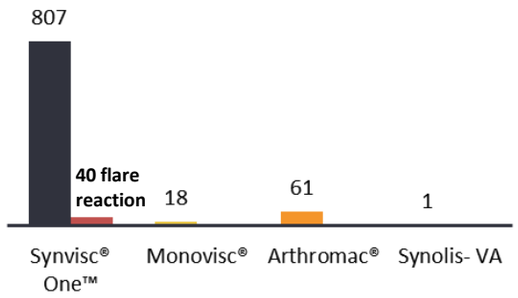
Adverse effects of viscosupplementation between 2013-2016



The safety profile for viscosupplementation was monitored between 2013 and 2016, and there were 40 cases of flare reaction. This reaction may present as effusion, arthralgia, erythema, heat, and is typically mild and self-limiting.

Patients are generally advised to rest, ice, limb elevate and take anti-inflammatory medications, if not medically contraindicated. No serious adverse effects such as septic arthritis or allergy/ anaphylaxis were noted.

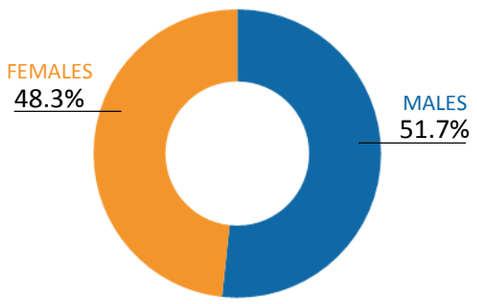
Number of viscosupplementation to number of flare reaction



There were 40 reports of flare in 29 patients of flare reaction after viscosupplementation. Only one patient had 2 flares during the period between 2013 and 2016. He reported flare reaction with the 2nd and 5th course of Synvisc® One™ viscosupplementation.

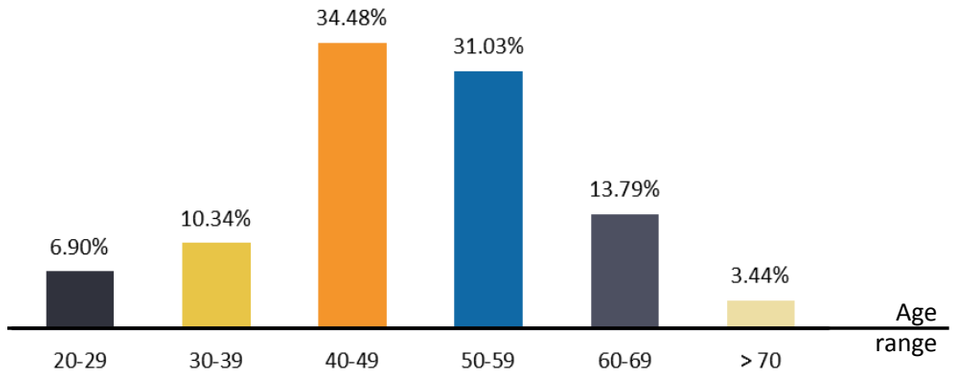
All 40 cases of flare reaction had received Synvisc® One™ viscosupplementation. Adverse effects occur in 4.96% of Synvisc® One™ viscosupplementation, which is consistent with published data[4, 5].

Ratio of gender for flare reaction post viscosupplementation

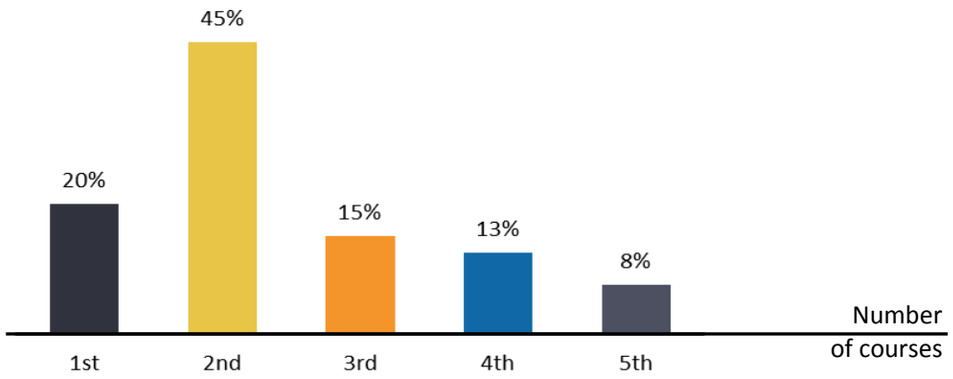


Patients were an average age of 49.3 years and there were more males (51.7%) than females (48.3%).

Age of population who had flare reaction following viscosupplementation



Percentage of flare reactions based on number of course of viscosupplementation



Those previously treated with viscosupplementation are more likely to experience a flare reaction. The majority of flare reaction was reported after the 2nd course of Synvisc® One™ viscosupplementation.

The incidence of adverse effect was high (80%) in those who previously received viscosupplementation than for those who received them for the first time (20%).

JG Prieto, MM Pulido, J Zapico, AJ Molina, M Gimeno, P Coronel, et al. Comparative study of hyaluronic derivatives: rheological behavior, mechanical and chemical degradation. Int J Biol Macromol, 35 (1-2) (2005), pp. 43–49

Watterson et al: therapeutic mechanisms and clinical potential in OA of the knee. J Am Acad Orthop Surg. 2000;8(5):277-284 Strauss et al, Hyaluronic acid viscosupplementation and osteoarthritis: current uses and futher directions. AM J Sports Med 2009;37(8): 1636-1644

Chevalier X, Jerosch J, Goupille P, et al. Single, intra-articular treatment with 6 ml hylan G-F 20 in patients with symptomatic primary osteoarthritis of the knee: a randomised, multicentre, double-blind, placebo controlled trial. Ann Theum Dis published online 19 Mar 2009; doi:10.1136/ard.2008.094623

Kemper F, Gebhardt U, Meng T, Murray C. Tolerability and short-term effectiveness of hylan G-F 20 in 4253 patients with osteoarthritis of the knee in clinical practice. Curr Med Res Opin. 2005;21(8):1261-9.

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