





Fig. 1: Descriptive statistics for age distribution in steroid group

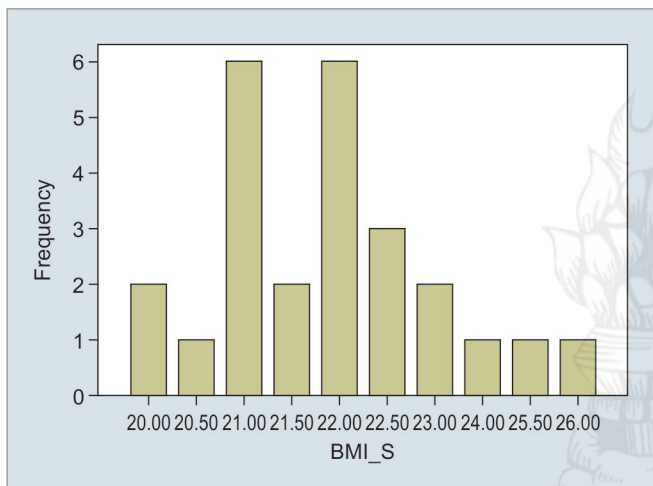


Fig. 3: Descriptive statistics for body mass index (BMI) in steroid group

Fig. 2: Descriptive study for age distribution in combined group



Fig. 4: Descriptive statistics for BMI in combined group

Table 3: Mean age for both groups

Age		
Mean	N	Std. deviation
56.2600	50	10.36440

Table 4: Mean BMI

BMI		
Mean	N	Std. deviation
22.6000	50	1.70832

**VAS**

Table 5 shows VAS for pain improved significantly from first visit to second visit and from first to third visit, but from second to third visit, though improvement was there but that was not statistically significant.

Table 6 shows that similar to steroid group, from second to third visit, there was no significant improvement, but from first to second and from first to third visit, there was statistically significant improvement of VAS pain in combined group.

Table 7 shows VAS pain in both groups improved in every visit, i.e., before interventions (V1) and after interventions (V2 and V3),

but there was no statistically significant difference of improvement between groups.

Table 8 shows that 50 feet walk time significantly improved from baseline to second visit and from baseline to third visit, but the improvement was not statistically significant from second to third visit.

Table 9 shows that 50 feet walk time improved significantly from first to second and from first to third visit in combined group, but no statistically significant improvement was seen from second to third visit.

Table 10 shows that 50 feet walk time improved in both groups in every visit, but difference of improvement was not statistically significant between groups.

**DROPOUT**

Thirty patients participated in each group, but on subsequent follow-up, five patients in each group failed to attend the department for follow-up, so in total, ten patients were dropped out from the study.

**ADVERSE EFFECTS**

No adverse effect occurred in any patient.

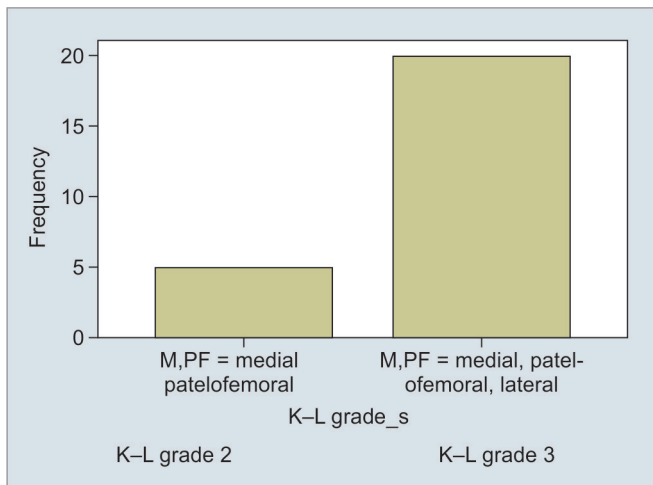


Fig. 5: Descriptive statistics for Kellgren Lawrence grade in steroid group (K L = Kellgren Lawrence)

Fig. 6: Descriptive statistics for K L grade in combined group (II = medial, patellofemoral III = medial, patellofemoral, lateral)

Table 5: Paired sample ttest for VAS pain of steroid group for all visits

		Paired differences			
		Mean	Std. deviation	Std. error mean	95% confidence interval of the difference
					Lower Upper
Pair 1	PAIN_VAS_V1_S PAIN_VAS_V2_S	1.72000	1.59478	0.31896	1.06171 2.37829
Pair 2	PAIN_VAS_V2_S PAIN_VAS_V3_S	0.92000	1.18743	0.23749	0.42985 1.41015
Pair 3	PAIN_VAS_V1_S PAIN_VAS_V3_S	2.64000	2.28910	0.45782	1.69510 3.58490

Table 6: Paired sample ttest for VAS pain of combined group for all visits

		Paired differences			
		Mean	Std. deviation	Std. error mean	95% confidence interval of the difference
					Lower Upper
Pair 1	PAIN_VAS_V1_SH PAIN_VAS_V2_SH	2.24000	2.18480	0.43696	1.33816 3.14184
Pair 2	PAIN_VAS_V2_SH PAIN_VAS_V3_SH	1.60000	2.27303	0.45461	0.66174 2.53826
Pair 3	PAIN_VAS_V1_SH PAIN_VAS_V3_SH	3.84000	2.52784	0.50557	2.79656 4.88344

Table 7: Paired sample ttest for VAS pain for between group comparison in all visits

		Paired differences			
		Mean	Std. deviation	Std. error mean	95% confidence interval of the difference
					Lower Upper
Pair 1	PAIN_VAS_V1_S PAIN_VAS_V1_SH	0.72000	2.74651	0.54930	0.41370 1.85370
Pair 2	PAIN_VAS_V2_S PAIN_VAS_V2_SH	1.24000	3.25679	0.65136	0.10434 2.58434
Pair 3	PAIN_VAS_V3_S PAIN_VAS_V3_SH	1.92000	3.96779	0.79356	0.28218 3.55782

Table 8: Paired sample ttest for 50 feet walk time of steroid group for all visits

		Paired differences			
		Mean	Std. deviation	Std. error mean	95% confidence interval of the difference
					Lower Upper
Pair 1	FIFTY_FT_WT_V1_S FIFTY_FT_WT_V2_S	2.52000	2.00250	0.40050	1.69341 3.34659
Pair 2	FIFTY_FT_WT_V2_S FIFTY_FT_WT_V3_S	1.04000	1.48549	0.29710	0.42682 1.65318
Pair 3	FIFTY_FT_WT_V1_S FIFTY_FT_WT_V3_S	3.56000	2.59936	0.51987	2.48704 4.63296

Table 9: Paired sample ttest for 50 feet walk time of combined group for all visits

			Paired differences			95% confidence interval of the difference	
			Mean	Std. deviation	Std. error mean	Lower	Upper
Pair 1	FIFTY_FT_WT_V1_SH	FIFTY_FT_WT_V2_SH	3.36000	3.82840	0.76568	1.77971	4.94029
Pair 2	FIFTY_FT_WT_V2_SH	FIFTY_FT_WT_V3_SH	1.68000	2.01494	0.40299	0.84827	2.51173
Pair 3	FIFTY_FT_WT_V1_SH	FIFTY_FT_WT_V3_SH	5.04000	4.33474	0.86695	3.25071	6.82929

Table 10: Paired sample ttest for 50 feet walk time for between-group comparison in all visits

			Paired differences			95% confidence interval of the difference	
			Mean	Std. deviation	Std. error mean	Lower	Upper
Pair 1	FIFTY_FT_WT_V1_S	FIFTY_FT_WT_V1_SH	1.28000	7.26590	1.45318	4.27922	1.71922
Pair 2	FIFTY_FT_WT_V2_S	FIFTY_FT_WT_V2_SH	0.44000	7.64897	1.52979	3.59734	2.71734
Pair 3	FIFTY_FT_WT_V3_S	FIFTY_FT_WT_V3_SH	0.20000	7.04746	1.40949	2.70905	3.10905

## DISCUSSION

The effectiveness of intraarticular injection of steroid<sup>6</sup> and HMW hyaluronate in primary osteoarthritis knee has been studied and claimed for a long time,<sup>7</sup> and there are many studies which compared the effectiveness of the two in primary osteoarthritis knee.<sup>8,9</sup> There is a lack of studies which compared the effectiveness of intraarticular injection of steroid and steroid plus HMW hyaluronate in primary osteoarthritis knee. This study showed that in primary osteoarthritis knee, a majority of patients were females as shown in Tables 1 and 2, and it is prevalent in older population with a mean age of 56.26 years as shown in Figures 1, 2 and Table 3. Obesity is an important factor which leads to escalation of cartilage degeneration, though in this study the mean BMI (body mass index) was 22.60 as shown in Figures 3 and 4 and Table 4. A majority of the patients had Kellgren Lawrence radiological grading III of OA knee as shown in Figures 5 and 6. Grade I and grade IV patients were not included in the study, as most of the grade I patients do not have significant pain and other discomforts, so detection of improvement could not be understood and comparison with other group would not be appropriate, and in grade IV patients, it is very difficult to administer injection intraarticularly as the joint space is greatly impaired with the presence of subchondral sclerosis in K L grade IV osteoarthritis knee.

Statistical analysis of primary outcome measures showed that VAS pain improved significantly from baseline visit to second visit and from baseline visit to third visit, and the improvement from second to third visit was not statistically significant in both the groups as shown in Tables 5 and 6. There was no statistically significant difference of improvement of VAS pain between two groups in each visit as depicted in Table 7. Analysis of fifty feet walk time also revealed similar kind of results. Statistically significant improvement of fifty feet walk time was seen from first to second and first to third visit, but improvement of second to third visit was not statistically significant in both the groups as shown in Tables 8 and 9. There was no statistically significant difference of improvement of 50 feet walk time between the groups in each visit as depicted in Table 10. Onset of improvement of pain could not be determined as most of the patients could not remember the time of onset; also, the duration of pain could not be determined

as the final follow-up was at 12th week. So, future research can be designed to study those. No adverse reaction occurred in any patient which suggests that both the treatment options are safe if not otherwise contraindicated.

## LIMITATIONS

The study had several limitations as follows:

Sample size was small in each group and no control group was taken. It was a short-term study as the final follow-up was at 12 weeks, so it was not possible to know the treatment effects after 12 weeks postinjection. Initial frequent follow-up and statistical analysis were not done, so this study has a limitation to conclude about the immediate postinjection effect. Image-guided interventions such as ultrasound or C-arm can be considered in future for further research.

## CONCLUSION

Both intraarticular injection of steroid and steroid plus HMW hyaluronate are effective in primary osteoarthritis knee in terms of reduction of pain and fifty feet walk time, and also, no treatment option is statistically significantly better than the other after six and twelve weeks postinjection.

## REFERENCES

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