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Increased Anticoagulant Requirement in Total Hip Replacement Patients Post-COVID: A Comparative Study in the Indian Population

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Learning Point of the Article:

Patients undergoing total hip replacement after COVID-19 infection may require a longer duration of LMWH for thromboprophylaxis in the Indian Population.

Abstract

Introduction: India's healthcare landscape features a blend of modern medicine and alternative systems, which gained widespread use during the COVID-19 pandemic. The undocumented use of traditional remedies and unregulated substances limited formal diagnosis and treatment records, complicating post-operative risk assessment. The pandemic has had lasting effects on vascular and coagulation systems. This study aims to evaluate and compare low molecular weight heparin (LMWH) requirements in patients undergoing total hip replacement (THR) in the pre- and post-COVID eras.

Materials and Methods: A retrospective cohort study was conducted, including 150 patients who underwent elective THR. The patients were divided into pre-COVID (2018–2019; n = 75) and post-COVID (2022–2024; n = 75) cohorts with no prior anticoagulant usage and no deep vein thrombosis (DVT) nor pulmonary embolism (PE) before the surgery. Post-COVID group includes patients who deny COVID infection. Data collected included demographics, comorbidities, LMWH dose and duration, laboratory values (D-dimer, prothrombin time [PT], activated partial thromboplastin time, platelet count), and post-operative outcomes such as DVT, PE, and bleeding complications. Statistical analysis included t-tests, Chi-square tests, and logistic regression.

Results: The post-COVID group showed significantly increased LMWH requirements: 77.3% received 60 mg (0.6 mL) versus. 42.7% in the pre-COVID group ($P < 0.00001$). The incidence of DVT was also higher post-COVID (17.3% vs. 4.0%, $P = 0.01$), while bleeding complications were not significantly different ($P > 0.05$). Elevated D-dimer and PT values persisted in the post-COVID cohort. Logistic regression identified post-COVID cohort as an independent risk factor for increased anticoagulation needs (odds ratio = 2.34, $P = 0.02$).

Discussion: Post-COVID patients demonstrate a prothrombotic state, likely due to persistent endothelial injury. The use of LMWH in adjusted doses was effective and did not increase bleeding risk, underscoring the need for tailored anticoagulation protocols.

Conclusion: THR patients in the post-COVID era exhibit a heightened thrombotic profile, possibly due to persistent endothelial dysfunction and coagulopathy induced by prior SARS-CoV-2 infection, necessitating increased anticoagulant dosages and duration, without a concomitant rise in bleeding events. These results support individualized anticoagulation protocols and post-operative monitoring, particularly in post-COVID patients, to optimize outcomes in high-risk orthopedic populations.

Keywords: Total hip replacement, COVID-19, low molecular weight heparin, thromboprophylaxis, Indian population.

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Table 1: Demographic and clinical characteristics of study participants

Characteristic	Post-COVID era (n = 75) (%)	Pre-COVID era (n = 75) (%)	P-value
Age (years)	65.3 ± 9.4	64.8 ± 8.9	0.74
Gender			0.73
Male	40 (53.3)	42 (56.0)	
Female	35 (46.7)	33 (44.0)	
Comorbidities			
Diabetes	38 (50.7)	36 (48.0)	0.74
Hypertension	43 (57.3)	42 (56.0)	0.87
Obesity (BMI > 30)	32 (42.7)	29 (38.7)	0.73
Surgical details			0.0018
Unilateral THR	58 (77.3)	72 (96.0)	
Bilateral THR	17 (22.7)	3 (4.0)	

BMI: Body mass index, THR: Total hip replacement

Table 2: Statistical analysis-risk factors for thrombotic events

Variable	OR	95% CI	P-value
Post-COVID era	2.34	1.15–4.75	0.02
Age >60 years	1.5	0.85–2.68	0.16
Diabetes mellitus	1.12	0.55–2.28	0.72
Hypertension	1.08	0.55–2.11	0.82

OR: Odds ratio, **CI:** Confidence interval, **BMI:** Body mass index

Introduction

India, a nation known for its vast cultural and regional diversity, also exhibits a wide spectrum of medical beliefs and practices beyond conventional allopathic medicine. Alongside modern healthcare, a significant portion of the Indian population continues to rely on alternative systems of medicine such as Ayurveda, Unani, Siddha, Homeopathy, and various traditional folk remedies. During the COVID-19 pandemic, these practices gained increased prominence, with many individuals turning to alternative treatments for both prophylactic and therapeutic purposes. These included the use of herbal concoctions, home remedies, and in some instances, unregulated substances such as extracted steroids. Due to socioeconomic challenges and superstitious beliefs, access to formal healthcare and education remains limited and unused. As a result, medical treatments were often undocumented, with no formal record of the patient's COVID-19 status, treatment protocol, or outcomes. This lack of documentation poses significant challenges in assessing COVID-19 infection status and treatment in an individual. The COVID-19 pandemic has had a lasting impact on the vascular and hematological systems, potentially altering anticoagulant needs in surgical patients.

Total hip replacement (THR) is a commonly performed orthopedic procedure that significantly improves the quality of life in patients with advanced hip pathologies. However, it carries a well-documented risk of venous thromboembolism (VTE), including deep vein thrombosis (DVT) and pulmonary embolism (PE), particularly in the post-operative period. Standard prophylactic anticoagulation regimens-such as low molecular weight heparin (LMWH), direct oral anticoagulants (DOACs), or warfarin-are routinely employed to mitigate these risks in line with established guidelines [1,2].

The COVID-19 pandemic has added a new dimension to the management of surgical patients especially in India due to the use of herbal potions, home remedies, and in some instances, unregulated substances, such as extracted steroids in undocumented evidences for prophylactic and treatment purposes leading to uncertainity of COVID-19 infection status. SARS-CoV-2 infection is now recognized to induce a hypercoagulable state through mechanisms involving endothelial injury, immune activation, and cytokine-mediated inflammation, leading to increased thrombin generation and fibrin deposition [3, 4]. Notably, this prothrombotic tendency can persist beyond the acute phase of infection, with elevated D-

Table 3: Anticoagulation therapy used in the postoperative period

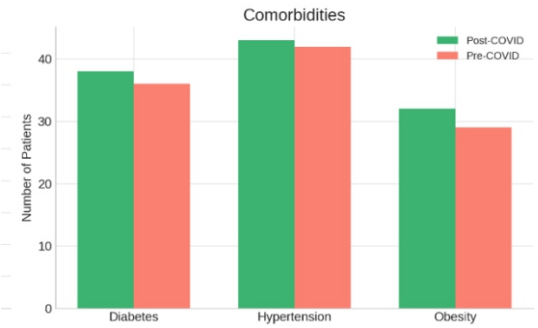
Medication Type	Post-COVID Era (n=75)	Pre-COVID Era (n=75)	p-value
Type of Anticoagulant			
LMWH	50 (66.7%)	38 (50.7%)	0.02
DOACs	18 (24.0%)	20 (26.7%)	0.75
Warfarin	7 (9.3%)	17 (22.7%)	0.06
Doses of Anticoagulant			0.0000013
Low Dose (40 mg)	17(22.7%)	43(57.3%)	
High Dose (60 mg)	58(77.3%)	32(42.7%)	
Duration of LMWH (days)			0.012
≤ 14	31(41.3%)	47(62.7%)	
> 14	44(58.7%)	28(37.3%)	

Era	Mean Dose	SD (estimated)	p-value ≈ 0.00001
Post-COVID Era (n=75)	55.47 mg	8.39	
Pre-COVID Era (n=75)	48.53 mg	9.90	

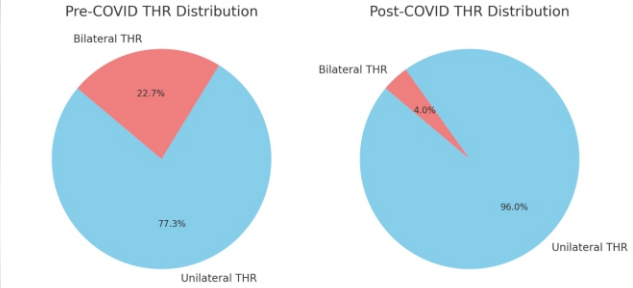
Table 4: Multivariate logistic regression model for predicting thrombotic events

Variable	OR	95% CI	P-value
Post-COVID era	2.34	1.12–4.92	0.02
Age (per year)	1.05	1.01–1.09	0.03
Diabetes	1.89	0.98–3.72	0.06
Obesity (BMI > 30)	1.45	0.79–2.64	0.22

OR: Odds ratio, **CI:** Confidence interval, **BMI:** Body mass index



Graph 1: Comorbidities (diabetes, hypertension, obesity).



Graph 2: Pre and post COVID total hip replacement distribution.

dimer levels and clotting abnormalities reported for several weeks or even months post-recovery [5, 6].

This lingering hypercoagulable state has significant implications for orthopedic surgery; particularly in procedures, such as THR that already carry a high baseline risk of VTE. Preliminary studies from Western populations suggest that post-COVID patients may require higher doses or prolonged courses of anticoagulation in the perioperative period to prevent thrombotic complications [7, 8]. However, there remains a paucity of data evaluating this phenomenon in the Indian population, where genetic, lifestyle, and healthcare access differences may alter thrombosis risk profiles [9].

Given the high burden of both COVID-19 and orthopedic surgeries in India, it is imperative to understand the influence of previous COVID-19 infection on anticoagulation strategies in THR patients. This study aims to compare anticoagulant requirements, thromboembolic events, and bleeding complications in THR patients with and without a history of COVID-19, thereby providing population-specific evidence to refine post-operative anticoagulation protocols in the post-pandemic era.

Materials and Methods

Study design

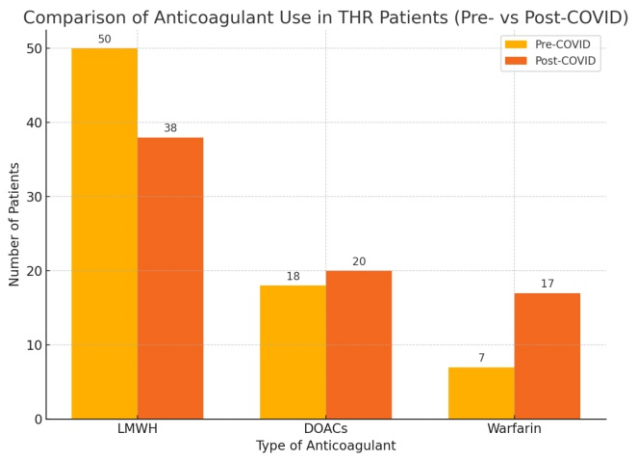
This is a retrospective cohort study designed to evaluate the anticoagulant requirements and thrombotic outcomes in patients undergoing THR surgery. The study was conducted by comparing patterns between the pre-COVID era (January 2018–December 2019) and the post-COVID era (October 2021–September 2024) all patients provided informed consent for the use of their clinical data.

Study population

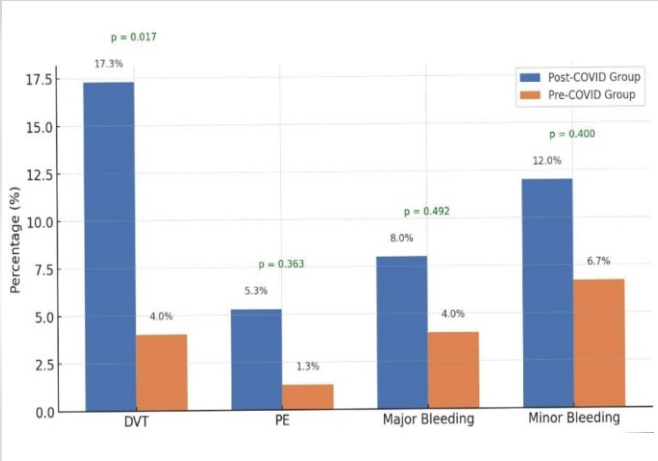
A total of 150 patients who underwent elective THR surgery during the study period were included in the analysis. Patients were divided into two groups.

Post-COVID era group

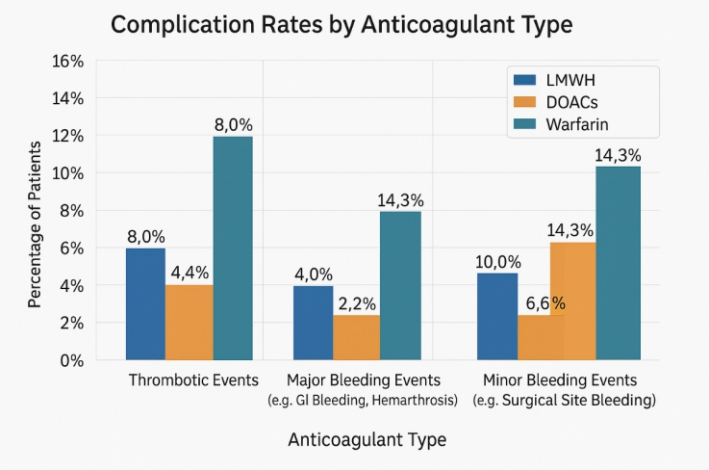
Patients without COVID-19 infection (no documents available) and tested negative (document available) 4 weeks before the surgery and not on any anticoagulants before the



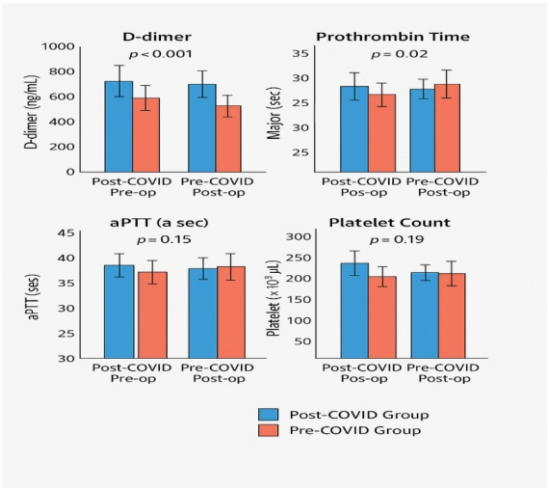
Graph 3: Distribution of anticoagulant types (low molecular weight heparin, direct oral anticoagulants, warfarin).



Graph 4: Thrombotic and bleeding events in the post-operative period.



Graph 5: Postoperative complications (thrombosis and bleeding) with anticoagulant type.



Graph 6: Laboratory values pre-and post-operative in both groups.

surgery.

Pre-COVID era group

Patients with no history of COVID-19 infection and not on any anticoagulants before the surgery.

Both groups were matched for age, gender, and comorbidities (e.g., diabetes, hypertension, obesity) to reduce confounding variables, as recommended by standard cohort matching techniques [10, 11].

Inclusion criteria

- Adults aged 40–80 years who underwent elective primary THR for avascular necrosis
- Patients with no evidence of superficial or deep venous thrombosis in lower limb venous doppler
- Patients with no evidence of PE in 2D-Echo
- Patients with no prior history of PE or deep venous thrombosis
- Patients with regular follow up at 6 weeks, 12 weeks, and 6 months
- Patients with a confirmed negative test of COVID-19 infection (based on real-time polymerase chain reaction or antigen test) in the post-COVID era minimum 4 weeks before the surgery.

Exclusion criteria

- Patients with a history of thrombotic disorders, such as protein C/S deficiency or antiphospholipid syndrome, as these conditions could independently affect anticoagulation requirements
- Patients on anticoagulants before the surgery
- Patients with evidence of superficial or deep venous thrombosis in lower limb venous doppler
- Patients with evidence of PE in 2D-Echo
- Patients with significantly elevated D-dimer, PT values pre-operatively
- Patients with a prior history of PE or deep venous thrombosis
- Patients with an already prothrombotic state pre-operatively
- Patients with active infections at the time of surgery
- Patients who had contraindications to anticoagulation therapy (e.g., active bleeding, major liver disease)
- Patients who underwent a major surgery (e.g., cardiovascular or abdominal surgery or unilateral THR) within 6 months before THR.

Data collection

Data were collected retrospectively from patient records, including:-

Demographics

Age, gender, and comorbidities such as diabetes, hypertension, cardiovascular disease, and obesity.

COVID-19 history

Negative test report at least 4 weeks before the surgery in the post-Covid group indicating no active infection.

Surgical details

Lab values pre- and post-operatively, blood loss, the incidence

of DVT and PE, and type of surgery (unilateral or bilateral done in two separate sittings).

Anticoagulation therapy

Type, dose, and duration of anticoagulation (LMWH, DOACs, or warfarin) prescribed post-operatively.

Outcome measures

Thrombotic events

Incidence of DVT and PE, confirmed by ultrasonography (venous Doppler of lower limb, 2D-Echo) or computed tomography, pulmonary angiography at 6 weeks, 12 weeks, and 6 months.

Bleeding complications

Incidence of major bleeding events, including gastrointestinal (GI) bleeding, surgical site bleeding, or hemarthrosis.

Laboratory measures

Preoperative and post-operative levels of D-dimer, prothrombin time (PT), activated partial thromboplastin time (aPTT), and platelet counts at 6 weeks, 12 weeks, and 6 months.

Statistical analysis

• Statistical analysis was performed using the Statistical Package for the Social Sciences version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were presented as means ± standard deviation or median with interquartile range, depending on the distribution. Categorical variables were expressed as counts and percentages. The following analyses were conducted:

• Descriptive statistics to summarize the demographic and clinical characteristics of both groups

• Mann–Whitney U tests (for non-normally distributed data) or Independent t-tests (for normally distributed data) were used to compare continuous variables between the groups [12]

• The chi-square test or Fisher's exact test was used to compare categorical variables such as the incidence of thrombotic and bleeding complications between the groups [13]

• Multivariate logistic regression analysis was used to identify independent risk factors for thrombotic and bleeding events, adjusting for potential confounders such as age, gender, diabetes, body mass index (BMI), anticoagulant type, and surgery type [14]

• A $P < 0.05$ was considered statistically significant for all analyses

• Sample size calculation-The sample size of 150 was calculated based on an expected difference in anticoagulant dosage and thrombotic events between the two groups. Assuming an alpha level of 0.05 and a power of 80%, a sample size of 75 patients per group was determined to be adequate to detect a clinically significant difference in anticoagulant requirements and thrombotic outcomes (effect size 0.5) [15].

Results

Table 1 compares demographic and clinical parameters between patients undergoing THR in the post-COVID and pre-COVID periods.

• Age: The mean age of patients in both groups was comparable (Post-COVID: 65.3 ± 9.4 years vs. pre-COVID: 64.8 ± 8.9 years). The difference was not statistically significant ($P = 0.74$), indicating a similar age distribution

• Gender: Both groups had a nearly equal gender distribution. Males constituted 53.3% in the post-COVID era and 56% in the pre-COVID era. $P = 0.73$, suggesting no significant difference in gender proportion between the two groups

• As described in Graph 1, Diabetes is present in 50.7% (Post-COVID) versus. 48.0% (Pre-COVID) with a P-value being 0.74, Hypertension is present in 57.3% with a $P = 0.87$, and Obesity (BMI > 30) in 42.7% with a $P = 0.73$. All comorbidities show no significant difference between the two groups

• Surgical details: As shown in Graph 2 a statistically significant ($P = 0.0018$) proportion of bilateral THR was required and performed in the post-COVID era (22.7%) compared to the pre-COVID era (4%). The bilateral THR's were performed in different settings.

Table 2 shows the study found that the post-COVID era has a significant predictor for an increased anticoagulant requirement, with an odds ratio (OR) of 2.34 ($P = 0.02$). This suggests that patients in the post-COVID era were more likely to require higher anticoagulation doses compared to those in pre-COVID era. While older age (above 60 years) was associated with an increased risk for thrombotic events, it was not statistically significant ($P = 0.16$). Similarly, diabetes and hypertension did not show a significant effect on anticoagulation requirements or thrombotic events ($P > 0.05$).

As shown in Graph 3, LMWH was the most commonly prescribed anticoagulant, used in 66.7% of cases, DOACs were used in 24.0%, and Warfarin in only 9.3%.This distribution reflects a clear clinical preference for LMWH in the post-COVID era, possibly due to its favourable safety profile and predictable pharmacokinetics in the setting of altered coagulation dynamics post-COVID.

The dosing pattern of anticoagulants as shown in Table 3, majority (77.3%) of patients in the post-COVID era required higher doses (60 mg) of LMWH and only 22.7% received a low dose (40 mg) as prophylaxis. This significant shift toward higher dosing suggests that patients in the post-COVID era may have a higher baseline prothrombotic risk, necessitating more aggressive thromboprophylaxis. Furthermore, most patients in the post-COVID era (58.7%) received LMWH for more than 14 days, compared to 41.3% who received it for ≤14 days. This trend supports the notion of extended prophylaxis being more common or necessary in the post-COVID period, likely due to prolonged inflammation and coagulation abnormalities post-infection. The mean anticoagulant dose in the post-COVID era was significantly ($P \approx 0.00001$) higher than in the pre-COVID era. This reinforces the finding that post-COVID patients require higher doses of anticoagulants, potentially due to lingering hypercoagulable states following COVID-19 infection. However, all patients were shifted to DOCA's after initial LMWH requirement.

Graph 4 shows the incidence of both major bleeding (e.g., GI Bleeding, Hemarthrosis) and minor bleeding (e.g., Surgical Site) complications were similar between the post-COVID and pre-COVID era, with no statistically significant difference ($P > 0.05$). Despite the increased anticoagulant dosage in post-COVID patients, the safety profile of anticoagulation was maintained, and bleeding complications were not more frequent in this group. The incidence of DVT and PE was slightly higher in the post-COVID era (17.3% for DVT and 5.3% for PE) compared to the pre-COVID era (4.0% for DVT and 1.3% for PE), but out of these differences only DVT shows a statistically significant increase in the post-COVID era and PE is not statistically significant ($P > 0.05$).

Graph 5 describes LMWH as the most commonly used and had moderate rates of thrombotic (8%) and bleeding complications (major: 4%, minor: 10%) which suggests a relatively balanced risk-benefit profile, DOACs showed the lowest overall complication rates, including lowest major bleeding (2.2%) and thrombotic events (4.4%) which indicates potentially safer in this patient group and Warfarin had the highest percentage of complications across all categories (14.3% each), though it was used in the smallest patient subgroup which suggests a higher risk profile, but interpretation is limited due to small sample size.

Graph 6 describes that D-dimer is significantly elevated post-operatively in the post-COVID era (900 vs. 680 ng/mL, $P < 0.001$) suggests a higher thrombotic risk or coagulation activation in post-COVID patients after surgery, PT has slight but statistically significant increase in PT post-operatively in the post-COVID era (14.1 vs. 13.8 s, $P = 0.02$) indicates mild delay in clotting, possibly reflecting altered coagulation dynamics post-COVID, aPTT is slightly increased post-operative in the post-COVID era (36.7 vs. 35.4 s), but not statistically significant ($P = 0.15$). There is no meaningful difference in intrinsic coagulation pathway activity. Platelet Count is decreased in the post-COVID era compared to pre-COVID (210 vs. 225 ×103/μL), but not statistically significant ($P = 0.19$) suggests a trend but no conclusive evidence of platelet suppression.

Table 4 is a Logistic Regression Analysis which is a standard method for analyzing risk factors for post-operative complications, such as thrombosis in THR patients. Patients in the post-COVID era have 2.34 times higher odds of complications and this association is statistically significant ($P = 0.02$) and the confidence interval (CI) does not include 1. Each additional year of age increases the odds by 5% and statistically significant; indicates that age is a risk factor. Diabetes has OR = 1.89 and $P = 0.06$ suggesting a possible association, but not statistically significant ($P > 0.05$). Might reach significance with a larger sample size. Obesity ($P = 0.22$) show no significant effect on the outcome. Their CI include 1, suggesting uncertain or null effect.

Discussion

This study investigates the anticoagulant requirements and related thrombotic risks in THR patients in the post-COVID era, comparing them to a pre-COVID baseline. The central finding is a significantly higher anticoagulant dose and longer duration of therapy among post-COVID patients, driven by an apparent elevation in thrombotic risk.

Baseline comparability

The demographic and clinical characteristics between the post-COVID and pre-COVID cohorts (Table 1) were statistically similar in terms of age, gender, comorbidities, and surgical type. This baseline equivalency strengthens the internal validity of our comparisons by reducing confounding bias. Studies such as those by Bikdeli et al. also emphasize the importance of baseline matching when evaluating thrombotic complications in post-COVID patients [16].

Increased thrombotic risk post-COVID

Post-COVID era was a significant predictor of increased anticoagulation requirement, with an OR of 2.34 ($P = 0.02$, Table 2). This aligns with existing literature that suggests persistent endothelial dysfunction, hypercoagulability, and systemic inflammation post-COVID as contributors to elevated thrombotic risk. Ackermann et al. demonstrated

endotheliosis and extensive microvascular thrombosis in autopsy studies of COVID-19 patients, indicating long-term vascular changes [17]. Multivariate analysis (Table 4) also confirmed that both post-COVID era (OR = 2.34, P = 0.02) and increasing age (OR = 1.05/year, P = 0.03) were independent predictors of thrombotic events.

Shift in anticoagulation practices

Our data (Table 3) indicates a clear shift toward more aggressive LMWH in post-COVID era THR patients:

- High-dose LMWH (60 mg) was used in 77.3% of post-COVID patients versus only 42.7% pre-COVID (P = 0.0000013)
- Mean LMWH dose was significantly higher (55.47 mg vs. 48.53 mg, P ≈ 0.00001)
- Duration of LMWH > 14 days was more common post-COVID (58.7% vs. 37.3%, P = 0.012).

These findings reflect a growing clinical awareness of prolonged hypercoagulability post-COVID. Present guidelines by ISTH and ACC have recognized post-COVID coagulopathy, particularly in high-risk surgical patients [18].

Choice of anticoagulant: LMWH versus DOAC versus warfarin

LMWH was preferred in the post-COVID era, likely due to Predictable pharmacodynamics, Minimal drug-drug interactions and Ease of monitoring, especially crucial in post-COVID patients with fluctuating renal and hepatic profiles.

DOACs, while associated with the lowest complication rates (Graph 5), were used less frequently, potentially due to limited perioperative data in complex cases, such as THR.

Warfarin, though used least, had the highest percentage of both thrombotic and bleeding events. However, these findings must be interpreted with caution due to the small sample size.

Safety profile of high-dose anticoagulation

Despite increased dosing in the post-COVID era, bleeding events were not significantly higher, with major bleeding 8.0% (post-COVID) versus. 4.0% (pre-COVID), P = 0.492, and minor bleeding: 12.0% versus. 6.7%, P = 0.4. This suggests that the benefits of intensified anticoagulation may outweigh the bleeding risks, especially when individualized.

Laboratory markers of coagulation abnormalities (Graph 6)

D-dimer levels in the immediate post-operative period were significantly elevated in the post-COVID era (900 ng/mL vs. 680 ng/mL, P < 0.001), indicating a higher burden of fibrin degradation products. In addition, PT was modestly but significantly prolonged until 6 months post-operatively in the post-COVID era (P = 0.02), reflecting altered coagulation kinetics. These lab findings validate clinical observations of a pro-thrombotic state even after COVID recovery. Elevated D-dimer until 3 months post-operatively has been consistently associated with worse outcomes and greater thrombotic risk in post-COVID cohorts [19].

Implications for clinical practice

Higher and prolonged LMWH dosing may be considered in patients in the post-COVID era undergoing THR. Routine monitoring of regular D-dimer and PT may help guide post-operative anticoagulation decisions. These recommendations are supported by emerging global evidence urging personalized anticoagulation protocols for high-risk post-COVID surgical patients [20].

Limitations

- Sample size may be underpowered to detect significance in less common events (e.g., PE)
- Long-term follow-up data on delayed thrombotic or bleeding complications was not captured.

Future multicentric studies with larger cohorts and longitudinal designs are essential to validate these findings and refine anticoagulant protocols.

Conclusion

This comparative study between patients in post-COVID and pre-COVID eras undergoing THR highlights a significant shift in anticoagulation management in the post-pandemic era. While the baseline demographics and comorbidities were similar between the two groups, the post-operative profiles diverged notably in terms of thrombotic risk, anticoagulant dosing, and laboratory parameters.

Patients of the post-COVID era demonstrated a statistically significant increase in thrombotic events, particularly DVT, and required higher doses and prolonged durations of anticoagulant therapy, especially LMWH. Laboratory findings further corroborated these clinical observations, with significantly elevated D-dimer levels and mildly prolonged PTs in the post-COVID cohort until approximately 6 months, suggesting a residual hypercoagulable state.

Importantly, despite the intensified anticoagulant regimen in the post-COVID era, bleeding complications did not significantly increase, underscoring the relative safety of higher-

dose prophylaxis when judiciously monitored. Among anticoagulants, LMWH appeared to strike a balance between efficacy and safety. DOACs demonstrated the lowest overall event rates but were used less frequently.

These findings support the emerging consensus that COVID-19 infection has enduring effects on the coagulation cascade, persisting well into the post-operative period. As elective surgeries resume in the post-pandemic phase, understanding and adapting to these altered risk profiles is critical to optimizing patient outcomes.

Clinical Message

India, a country with wide diversity and cultural beliefs also has a wide variety of medical beliefs other than allopathic medicine. Most of the Indian population is still following the other form of medicine and has continued during the time of Covid era for both prophylactical and treatment purposes which included extracted steroids as well. Due to the low economical status and lack of education, most of the documents of the treatment were not preserved and the status of covid infection and the course of treatment are unknown. Therefore, Surgeons must consider the altered coagulability profile in post-COVID era patients undergoing THR, necessitating extended LMWH use to prevent thromboembolic events and ensure safer post-operative outcomes.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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