



## Not all Calcium Tablets are the Same

**Gupta PK\* and Kumar R**

Indian Spinal Injury Center, Vasant Kunj, India

**\*Corresponding author:** Pratyaksh Kumar Gupta, Indian Spinal Injury Center, Vasant Kunj, India

### Mini Review

Volume 10 Issue 4

Received Date: September 23, 2026

Published Date: October 14, 2026

DOI: 10.23880/jobd-16000298

### Abstract

Calcium supplements sold in Indian pharmacies differ substantially in elemental calcium content, dosing frequency, food dependence, and gastrointestinal tolerability, yet these differences are rarely explained when a tablet is dispensed. This review compares the seven calcium formulations available in India- calcium carbonate, calcium phosphate, calcium citrate malate (CCM), calcium pidolate, calcium lactate, calcium lactogluconate, and calcium glubionate-summarising elemental calcium percentage, recommended dosing, food requirements, and stomach tolerance for each, drawing on published bioavailability and epidemiological data. While calcium carbonate remains the most affordable and widely prescribed option, CCM offers the highest bioavailability (>35%) and does not require gastric acid for absorption, making it preferable for elderly patients, those on acid-suppressing therapy, and individuals with malabsorption. Practical guidance is provided on dose splitting, Vitamin D3 co-administration, spacing from iron supplements, and the daily upper limit of elemental calcium.

**Keywords:** Calcium Supplements; Gastrointestinal Tolerability; Bioavailability; Vitamin D3; Iron Supplements

### Abbreviations

CCM: Calcium Citrate Malate; PPIs: Proton Pump Inhibitors.

### Introduction

When we visit a chemist shop in India and ask for a calcium tablet, the pharmacist may hand you any one of a dozen different brands. There is a catch here. The type of calcium inside the box makes a significant difference to

how much your body actually absorbs, when you must take it, and whether it causes any side effects. There are seven main calcium formulations available in Indian pharmacies [1].

The comparison Table 1 below summarises all seven formulations-their elemental calcium content, daily dose, dosing interval, whether they need food, stomach tolerance, and who each one is best suited for.

| Formulation                   | Elemental Ca % | Daily Dose     | Dosing Interval  | Needs Food?  | Stomach Friendly? | Best For                                                                                  |
|-------------------------------|----------------|----------------|------------------|--------------|-------------------|-------------------------------------------------------------------------------------------|
| <b>Calcium Carbonate</b>      | 40%            | 500–1,200 mg   | Once daily       | YES-must     | Moderate          | Most healthy adults; budget-conscious; widely available. Antacids interfere in absorption |
| <b>Calcium Phosphate</b>      | 38.80%         | 1,200 mg       | Once daily       | Preferably   | Good              | Adults avoiding constipation; bone-specific supplement                                    |
| <b>Calcium Citrate Malate</b> | 26%            | 500–1,200 mg   | Once–twice daily | NOT required | Very Good         | Highest bioavailability; on antacids/PPIs; malabsorption                                  |
| <b>Calcium Pidolate</b>       | 13.50%         | 1,000–1,500 mg | Every 8–12 hrs   | NOT required | Very Good         | Elderly; on acid-reducing medicines; sensitive stomach                                    |
| <b>Calcium Lactate</b>        | 12.90%         | 500–1,000 mg   | Every 6–12 hrs   | NOT required | Excellent         | Children; infants; sensitive stomachs; syrups                                             |
| <b>Calcium Lactogluconate</b> | 6.80%          | 1,000 mg       | Once daily       | NOT required | Excellent         | Elderly; effervescent tablets; cannot swallow pills                                       |
| <b>Calcium Glubionate</b>     | 6.50%          | 500–1,500 mg   | Once daily       | NOT required | Excellent         | Babies; infants; toddlers; pregnant women (syrup)                                         |

**Sources:** PMC10721582 (AIIMS Raipur); PMC9739452; PubMed PMID 20690187; ICMR-NIN 2020

**Table 1:** Comparative Overview of All Seven Calcium Supplement Formulations Available in India.

### The Seven Calcium Formulations-Explained for Everyone

Elemental calcium is the actual usable calcium your body receives from a tablet. A tablet labelled 1,250 mg does not deliver 1,250 mg of calcium to your bones-only a percentage of it is pure calcium, the rest being the carrying compound. The higher the elemental calcium percentage, the fewer tablets you need each day.

#### Calcium Carbonate

Calcium carbonate is the most widely used and most affordable calcium supplement in India, and it contains the highest elemental calcium of any formulation at 40%. A standard 1,250 mg tablet delivers 500 mg of actual calcium, which is why popular brands such as Shelcal-500 and Cipcal-500 use it. It is available both alone and combined with Vitamin D3-the preferred combination since Vitamin D is essential for calcium absorption. The critical rule is that calcium carbonate must always be taken with food, because it needs stomach acid to dissolve. On an empty stomach, much of it passes through the body unused. Its main limitations are constipation and bloating in some people, and reduced effectiveness for those on acid-reducing medicines. For the vast majority of healthy Indian adults, however, calcium carbonate with Vitamin D3 remains the best all-round daily choice-maximum calcium, minimum cost, available at every chemist [2,3].

#### Calcium Phosphate

Calcium phosphate contains 38.8% elemental calcium and has one important distinction: it closely mirrors the mineral composition of human bone, which is made of hydroxyapatite-calcium bonded with phosphate. It is gentler on the stomach than carbonate, does not cause constipation as readily, and does not need as much stomach acid to dissolve. It is widely used in combination bone health formulations prescribed by orthopaedic surgeons across India. People with kidney disease should avoid it without medical supervision, as the kidneys control phosphate balance.

#### Calcium Citrate Malate

Calcium citrate malate (CCM) is formed by combining calcium with citric and malic acids-two organic acids found naturally in fruits. Among all seven formulations, CCM has the highest bioavailability, meaning the body absorbs it most efficiently. A review in the Indian Journal of Orthopaedics confirmed CCM provides 26% elemental calcium and a bioavailability above 35%, the highest of all available formulations. A PubMed study (PMID: 10231607) found positive effects on bone density in prepubertal girls, adolescents, and adults, improved further by Vitamin D and trace minerals. Crucially, CCM does not require stomach acid for absorption, so it can be taken with or without food and suits people on antacids or acid-blocking medicines [4].

### Calcium Pidolate

Calcium pidolate bonds calcium to pidolic acid, a natural compound the body readily recognises, which allows calcium to enter body cells more efficiently. Research found its bioavailability to be approximately 38%. Like CCM, it does not require stomach acid, making it suitable for elderly individuals whose stomach acid naturally declines with age, and for those on proton pump inhibitors (PPIs). Its elemental calcium content is only 13.5%, so it must be taken two to three times daily to meet the recommended dose -less convenient and more expensive than carbonate [5].

### Calcium Lactate

Calcium lactate combines calcium with lactic acid-the same mild acid found in curd and buttermilk. It is extremely gentle on the stomach, water-soluble, and requires no stomach acid, so it can be taken with or without food. With 12.9% elemental calcium, it is the standard formulation for children's supplements across India-available as syrups, suspensions, and chewable tablets that children accept readily. Research confirms good bioavailability even in Vitamin D deficient conditions. For adults needing large doses, the low calcium percentage makes it impractical, but for children and those with sensitive stomachs it is the kindest, most well-tolerated option available [6].

### Calcium Lactogluconate

Calcium Lactogluconate combines calcium with lactic and gluconic acids to produce a highly water-soluble, tasteless salt most commonly sold as effervescent tablets-dropped into a glass of water to form a fizzy drink. It contains 6.8% elemental calcium, so it is always combined with calcium carbonate in the same tablet to bring the dose to a useful level. Because it dissolves completely and needs no stomach acid, it suits elderly individuals who struggle to swallow large tablets. Bioavailability is good and stable over time [7].

### Calcium Glubionate

Calcium Glubionate combines calcium with gluconic acid to produce a sweet, pleasant-tasting liquid syrup -the gentlest calcium preparation available. With only 6.5% elemental calcium per unit, it is not practical for adults, but is perfectly designed for babies, infants, and toddlers. Brands use it as the primary ingredient, often combined with carbonate to increase the total dose. It requires no tablet swallowing, causes virtually no stomach upset even in newborns, and is given once daily. It is also prescribed for pregnant women needing a very mild, stomach-friendly supplement [8].

### Which Calcium Supplement is Right for you?

When it comes to choosing the best calcium supplement, the evidence clearly points to calcium citrate malate (CCM) as the superior formulation for daily use. Among all seven formulations, CCM offers the highest bioavailability-meaning your body absorbs more of the calcium you actually take. A review published in the Indian Journal of Orthopaedics confirms that CCM delivers a bioavailability above 35%, higher than any other calcium salt available. A study further demonstrated positive effects on bone density across all age groups children, adolescents, and adults alike. Unlike many other formulations, CCM does not need stomach acid to be absorbed, so it can be taken with or without food at any time of day. This makes it suitable for virtually everyone-healthy adults, the elderly whose stomach acid has declined, those on antacid or acid blocking medicines, people with malabsorption conditions, and those who simply want the most efficient calcium supplement available. Many Indian brands already use CCM as their active ingredient, and it is available at most pharmacies across India, combined with Vitamin D3 for optimal absorption [9,10].

For children, calcium citrate malate is available in paediatric formulations, though calcium lactate syrup remains the most widely prescribed option for younger children due to its palatability. For babies and infants, calcium glubionate syrup continues to be the standard. For elderly patients who struggle to swallow tablets, CCM or calcium lactogluconate effervescent dissolved in water offer the most comfortable once-daily experience without any dependence on stomach acid.

Three rules apply universally. Never take more than 500 mg of elemental calcium at one time-split your daily dose into two servings for better absorption. Always ensure adequate Vitamin D3, either within your supplement or separately, as calcium cannot be properly absorbed without it. And if you are taking iron tablets, keep them at least two hours apart from calcium as both compete for absorption in the gut. Do not exceed 2,500 mg of elemental calcium per day.

### References

1. Harinarayan CV, Akhila H, Shanthisree E (2021) Modern India and Dietary Calcium Deficiency-Half a Century Nutrition Data-Retrospect-Introspect and the Road Ahead. *Front Endocrinol* 12: 583654.
2. Agrawal AC, Garg AK (2023) Epidemiology of Osteoporosis. *Indian J Orthop* 57(S1): 45-48.
3. Amarnath SS, Kumar V, Barik S (2023) Vitamin D and Calcium and Bioavailability of Calcium in Various Calcium Salts. *Indian J Orthop* 57: 62-69.

4. Patrick L (1999) Comparative absorption of calcium sources and calcium citrate malate for the prevention of osteoporosis. *Altern Med Rev* 4(2): 74-85.
5. Ye SK, Ren X, Meng XX, Chen HY (2020) Comparison of calcium supplementation methods in osteoporosis. *Exp Ther Med* 19(2): 1432-1438.
6. Meiron OE, David EB, Aflalo ED, Shechter A, Stepensky D, et al. (2011) Bioavailability of stabilized amorphous calcium carbonate. *J Bone Miner Res* 26(2): 364-372.
7. Jakubik AP, Staniaszek G, Brzozowska P, Socha K (2022) Quality of Calcium Food Supplements: Evaluation Compared to Manufacturers' Declarations. *Molecules* 27(23): 8154.
8. Tsugawa N, Okano T, Higashino R, Kimura T, Oshio Y, et al. (1995) Bioavailability of calcium from calcium carbonate, DL-calcium lactate, L-calcium lactate and powdered oyster shell calcium in vitamin D-deficient or -replete rats. *Biol Pharm Bull* 18(5): 677-682.
9. Meeta M (2022) How Much Calcium Does an Indian Postmenopausal Woman Need? *J Midlife Health* 13(1): 9-14.
10. (2020) ICMR-NIN. Nutrient Requirements for Indians-RDA, Hyderabad.