

Evaluation of Glucocorticoids Utilization in Central Kerala using Pharmacy Sales Overview

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Abstract

Background: Misuse of prescription drugs is a major public health problem in India and developing countries. Emerging evidence indicates that glucocorticoids are a class of drugs that are silently misused. These drugs are inexpensive and easily available as over-the-counter drugs in India are widely used by local practitioners and self-prescribed by patients for swift symptomatic relief of febrile illnesses, joint pain, asthma, other respiratory illnesses, and skin diseases. Many people have become dependent on glucocorticoids unintentionally and remain completely unaware of the metabolic changes occurring in their bodies. **Methodology:** A descriptive cross-sectional study involving 38 pharmacies in Thiruvalla municipality of South India was conducted to indirectly assess the utilization of glucocorticoids in the region using a pharmacy sales overview. **Results:** Most people approach pharmacies with prescriptions than without. A high majority of pharmacists do not have any knowledge about the uses (37%) or adverse effects (66%) of glucocorticoids. More than 50% of the community pharmacies have more than 1% of their sales attributed to glucocorticoids when compared with the total sales volume of drugs.

Keywords: Glucocorticoid, misuse, pharmacists, South India

BACKGROUND

Glucocorticoids are important agents used in the treatment of many inflammatory, immunologic, and hematologic diseases.^[1] This wonder drug has helped alleviate the symptoms of many ailments.^[2,3]

Pulmonary diseases such as idiopathic interstitial pneumonia, hypersensitivity pneumonitis, and sarcoidosis; autoimmune conditions; neurologic diseases such as myasthenia gravis and multiple sclerosis; and inflammatory bowel diseases are a few of the notable diseases benefitting from chronic glucocorticoid use.^[4-6] More recently, long term glucocorticoid therapy plays an important role in modulating the immune system following solid organ transplantation.^[7]

However, because these drugs being inexpensive and easily available as over-the-counter drugs in India, they are widely used by local practitioners^[8,9] and self-prescribed by patients for swift symptomatic relief of febrile illnesses, joint pain, asthma, other respiratory illnesses, and skin diseases.^[9,10] Hence many people have become dependent

on glucocorticoids unintentionally and remain completely unaware of the metabolic changes occurring in their bodies.^[11,12]

Prolonged glucocorticoid misuse leads to Cushingoid features and hypoadrenal crisis by suppression of the hypothalamo-pituitary-adrenal axis when they abruptly discontinue the intake of glucocorticoid.^[13-15] Moreover, prolonged use of glucocorticoids results in long-term complications like osteoporosis, type 2 diabetes mellitus, hypertension,^[15] cataract,^[12] and predisposition to infections like tuberculosis and fungal infections.^[16]

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Medication misuse is a major public health problem in India.^[17] Antibiotics are not the only drugs that are prescribed irrationally^[17-20] as the published research work in North India is beginning to show that glucocorticoids are a class of drugs that are silently misused.^[21-24] In a hospital-based study conducted in north Bihar, among 22 patients who were presented with glucocorticoid misuse over 6 months, more than half were self-prescribed and the remaining were prescribed by local practitioners.^[21] There is a dearth of literature regarding the magnitude of its misuse in South India and Kerala.

Thiruvalla is a small town in Central Kerala state of southern India. In this study, we aim to explore the scenario in Thiruvalla by finding the proportion of glucocorticoid sales in community pharmacies across Thiruvalla town in comparison with a hospital pharmacy. This will enable us to further address the issue of misuse of glucocorticoids.

METHODOLOGY

A cross-sectional study was conducted from August 1, 2019 to November 1, 2019 in the Thiruvalla Municipality area. Thiruvalla is a town in the district of Pathanamthitta in Central Kerala of Southern India. The town has two medical colleges and many hospitals catering to 1.2 million population of the district.

Hospital pharmacy is one that is attached to a teaching/training institution where the sale is based solely on the prescription of a registered qualified practitioner of modern medicine. Community pharmacies are not attached directly to a health care delivery unit; may, or may not issue medication based on prescriptions from a registered medical practitioner. The study assessed all the community pharmacies in the Thiruvalla town, 38 in number and one hospital pharmacy attached with the medical college.

All the community pharmacies in the town were mapped using Yellow Pages and further snowballing by inquiry with the identified pharmacies about nearby pharmacies. Following an appointment with the proprietor of the pharmacy, all these pharmacies were visited and permission was sought to access the sale of glucocorticoids from the proprietor. The details and implications of the study were explained to the proprietor prior to the survey.

A pre-tested questionnaire was developed and used for the survey. Content evaluation of the questionnaire was done by experts from Endocrinology and Public health. The study assessed the sale of oral formulations of betamethasone, dexamethasone, deflazacort, hydrocortisone, triamcinolone, budesonide, methylprednisolone, and prednisolone. The questionnaire collected details about the sale of glucocorticoids as a proportion of the total drug sale in the past three months. The total sale of drugs was estimated based on the number of drugs sold and the cost of the drug. To verify this information, the sale of the total number of strips of glucocorticoids in the past 1 week was collected and extrapolated for the 3 months

at the pharmacy counter, on the spot. Assessment of the knowledge of the pharmacist was done using a checklist where he/she was asked to correctly identify the uses and adverse effects of the drug from among the multiple choices given.

Informed Consent was obtained from the pharmacist proprietor after explaining the purpose and benefits of the study. The participant was free to withdraw from the study any time he/she wished to. The study was approved by the Institute Research Board and Ethics Committee of Believers Church Medical College Hospital before the commencement of the study (IRB No. IEC/2019/04/91).

RESULTS

Thirty-eight pharmacies were identified in the Thiruvalla municipality area. Among the 32 pharmacies that responded regarding the request for prescription for dispensing drugs, 26 pharmacies (68%) responded that a prescription is brought for dispensing the drugs. Computerization was available in thirty pharmacies (79%). Eleven pharmacies (29%) were located in the vicinity (less than half a kilometer) of the hospital.

The knowledge of the pharmacist was assessed regarding the uses and adverse effects of oral glucocorticoid drugs. Only 34% (n = 13) responded correctly, 11 (29%) responded incorrectly, and 14 (37%) responded as "DON'T KNOW" regarding the uses of glucocorticoid drugs. Regarding the adverse effects of drugs, 21% (n = 8) responded correctly, while 79% (n = 30) responded incorrectly or as "DON'T KNOW" [Table 1].

The proportion of sales of glucocorticoid drugs with respect to the total drug sale is less than 10% in most of the pharmacies. The overview of the sale is depicted in Table 2. Oral glucocorticoids were ranked as the most sold drug in only one pharmacy. Non-Steroidal Anti Inflammatory Drugs (NSAIDS) were found to be the most frequently sold drug in 8 (21%) of the pharmacies. Anti-hypertensives and anti-diabetic medications were the most commonly sold drugs in 14 pharmacies (37%) [Table 3].

Table 1: Knowledge about use and misuse of drugs (n=38)

Knowledge on	Correct	Incorrect	Don't know
Uses of GC drugs	13 (34%)	11 (29%)	14 (37%)
Adverse effects of GC drugs	08 (21%)	05 (13%)	25 (66%)

Table 2: Proportion of oral glucocorticoid sale with the total drug sale (n=29)

GC sale/Total drug sale %	n	%	95% CI
0-1%	15	51.7	32-70%
2-5%	7	24.1	10-43%
6-10%	3	10.3	2-27%
11-20%	0	0	--
21-50%	3	10.3	2-27%
>51%	1	3.4	0.09-18%

Table 3: “Most sold” drugs in pharmacies (n=36)

Drugs	n	%	95% CI
NSAIDs	8	21.1	10-39%
Anti-Diabetic medication	7	18.4	8-36%
Anti-hypertensives	7	18.4	8-36%
Antibiotics	4	10.5	3-26%
Others	9	23.7	12-42%
Oral Gluco corticoids	1	2.6	0.07-14.5%

None of the pharmacies received any prescriptions from practitioners of other alternative systems of medicine (those prescribing non-allopathic medicines, e.g., Ayurvedic, Unani, homeopathic).

The hospital pharmacy sees an average of 850 patients/day compared to community pharmacies that see only around 70 customers a day. The most sold drugs are antipyretics and analgesics in other pharmacies compared to proton pump inhibitors in the hospital pharmacy. The chief pharmacist in the hospital pharmacy knew the adverse effects of glucocorticoids and their uses correctly. Most other pharmacists did not know them at all. An overview of the sales of individual drugs highlight that the hospital pharmacy sold more tablets of any given drug per week but the proportion of sales of glucocorticoids is only 0.2%.

DISCUSSION

More people approach pharmacies with prescriptions than without. A total of 26 out of 34 pharmacies observe strict prescription practices. A systematic review by Jain *et al.*^[18] observed ineffectiveness in prescription practices in the health service providers. Another cross sectional community based study done by Roza *et al.*^[25] in rural Andhra Pradesh found that the main source of self-medication was directly from the pharmacy, that is, pharmacists or store keepers (72.6%). The opposite result in the present study could be due to the fact that either the pharmacies abide by the regulations or due to the awareness and education of the people in this particular municipality. It could also be due to the fact that the pharmacies are clustered around the health facilities ensuring that the patients have the prescription at hand.

Most pharmacies (53%) in this area are situated within 500–1000 m from the nearest health facility; the remaining are located within 500 m (31.6%), or within 1–3 km (16%). A study by Miguel Padeiro in “Lisbon in Spain”, observed that the nearest Community Health Centre was less than a 1-minute walk while in our area, the nearest Health Centre is less than a 5-min walk.^[26] This could be due to the fact that our area prioritizes health.

The computerization of pharmacies would imply they keep records of their sales. A little over three quarters of the pharmacies (78%) in our survey were computerized. As a developing economy, we are not on par with the developed

world and but still, there are many computerized pharmacies in Kerala.

A majority of the pharmacists did not have any knowledge about the uses (36.8%) or adverse effects (65.8%) of systemic glucocorticoids. An interventional study on the role of clinical pharmacists in the identification and Management of Corticophobia by Ahmad *et al.*^[27] in Jordan observed a decrease in fear and improvement in compliance of the patients on intervention by clinical pharmacists.^[27] The difference could be due to the fact that the pharmacies are in general entrepreneurial. All the pharmacies are supposedly strictly monitored by government agencies, but despite this, the general perception of the people is that there is malpractice by pharmacy owners. Corticosteroids have some major side effects such as hyperglycemia, osteoporosis, weight gain, etc., that patients in both Jordan and this part of Kerala are aware of and fearful about.

The most sold drugs in most pharmacies are NSAIDS (21%) followed by antihypertensives (18%) and diabetic drugs (18%). Glucocorticoids were the most sold medication in only one pharmacy. Glucocorticoids contributed only 0.2% of sales in the medical college. About 52% of the pharmacies estimated that the sales of glucocorticoids were less than 1%. Analgesics followed by drugs for lifestyle diseases were the most sold drugs in the community pharmacies. Roza *et al.*, in their community study,^[26] found analgesics were commonly (85%) self-medicated drugs. Even though this study does not claim that the use of analgesics is by self-prescription, the findings of this study aligns with their observation. We have an aged population^[28] in our study location. A study by Harikrishnan *et al.*^[29] has shown that the prevalence of lifestyle diseases is high in this part of India. The Global Burden of Disease Study^[30] also adds to this high prevalence of lifestyle diseases in Kerala. This attributes to the high sales of these drugs.

In the hospital pharmacy, the volume of sales of glucocorticoids was only 0.2% of the total sale. In the present study, 50% of the community pharmacies have more than 1% of their total volume of sales attributed to glucocorticoids. This calls for further studies on glucocorticoid misuse in the community.

This study is an estimation of the sale of glucocorticoids in the Thiruvalla municipality. The information collected is based on the survey and information given by the pharmacists which can be biased. The total sale of drugs was estimated based on the number of drugs sold as well as their cost. The hospital pharmacy might be the location from where more expensive steroids are prescribed when compared with other pharmacies but still, glucocorticoid sales accounted for only 0.2% of the total sale.

CONCLUSION

Oral glucocorticoids are sold by all the pharmacies surveyed in the Thiruvalla District. The proportion of the sale of glucocorticoid drugs with the total drug sale is less than 10% in most of the pharmacies but the correct knowledge regarding

the use and misuse of this drug is poor among pharmacists which call for further interventions as this opens a window for misuse of the drugs.

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Conflicts of interest

There are no conflicts of interest.

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