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Original Article

Identification of Established Drugs for Contemporary Indications: A Hospital Based Study

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Abstract

Drug repurposing offers a cost-effective and time-efficient alternative to traditional drug development by identifying new therapeutic uses for established drugs. This study aimed to identify established drugs with potential new indications, examine changes in drug categories, and observe variations in dosage and frequency. A cross-sectional study was conducted over six months at Santhiram Medical College and General Hospital, Nandyala, across multiple specialised departments, including Neurology, Cardiology, and Gastroenterology. Patients aged 18–60 years were included, and 157 case files were analysed. Prescriptions were cross-referenced with subjective and objective evidence, excluding those aligned with either. The study was approved by the Institutional Ethics Committee (Ref. No. IEC/SRMC/SRCP/RESEARCH/006/2023, dated 29.08.2023). The results identified nine contemporary-indicated drugs, with Aspirin (27.39%) and Dapagliflozin (21.01%) being the most frequent. Seven drugs, including Atorvastatin, Gabapentin, Levetiracetam, and Flupirtine maleate, showed changes in indication categories, while Sildenafil and Tadalafil retained their original categories. Aspirin demonstrated dosage modifications, and both Aspirin and Sildenafil displayed changes in frequency between old and new indications. The findings revealed notable shifts in categorisation, dosage, and frequency, offering insights into the evolving therapeutic roles of these drugs. In conclusion, this study highlights the potential of drug repurposing, identifying promising candidates for new indications and emphasising the need for further clinical validation to ensure safety and efficacy. These results provide a valuable foundation for advancing drug repurposing research to benefit healthcare systems and patients.

Keywords: *Contemporary Indications, Drug Repurposing, Established Drugs*

Introduction

Drug Repurposing (DR) is sometimes referred to as therapeutic switching, drug recycling, drug redirection, drug retasking, drug re-profiling, and drug repositioning (Rao *et al.*, 2022). It can be described as the process of finding new pharmacological indications for previously discovered, underutilised, experimental, already-marketed, and FDA-approved drugs and then using those newly developed drugs to treat conditions unrelated to their intended therapeutic uses (Rudrapal, Khairnar & Jadhav 2020). The concept of drug repurposing is quite new, evidently emerging in 2004 with an article published by Ash Burn and Thor. They described the process of finding new uses for already existing drugs as drug repurposing (Jourdan *et al.*, 2020). Most notably, there are currently limited options for the majority of the 6,000–8,000 rare diseases, with only 5% of diseases having an approved treatment option. The development of new therapies for rare diseases is often challenging due to factors such as limited patient populations, disease complexity, lack of understanding of disease pathobiology, and high development costs. Therefore, drug repurposing has the potential of being time- and cost-efficient,

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compared to de novo drug development (Jonker *et al.*, 2024). Developing a brand-new drug can cost up to $1 billion and take up to ten years due to the extensive preclinical testing, clinical trials, and studies involved. Repurposing drugs, however, makes use of drugs that are already approved and have proven safety profiles, which cuts down on the money and time required for studies. This technique permits researchers to quickly move promising compounds into clinical use, skipping some of the early steps in drug development. Certain studies have proven that between 30% and 40% of drugs approved by the USFDA between 2007 and 2009 can be considered repurposed or repositioned drugs. Similarly, a study discovered that 35% of transformative drugs that were novel and had ground-breaking effects on patient care—approved by the FDA between 1984 and 2009—were repurposed products (Krishnamurthy *et al.*, 2022). The success rate of drug repurposing is usually below 10%, which can be considered relatively high (Kim 2022). A search of the term 'drug repurposing' in PubMed for the last 5 years presented more than 8,000 results, out of which about 6,000 have been published since 2020. Drug repurposing has gained more attention in the last 5 years, especially during the COVID-19 pandemic (Van der Pol *et al.*, 2023). People frequently get infected globally with the so-called coronaviruses, which usually cause respiratory illness. As they were not recognised as an important public health threat, the search for a specific antiviral remedy or a vaccine had not been a priority goal. Subsequently, when SARS-CoV-2 emerged, there was no specific antiviral for coronavirus diseases, including COVID-19. The classical methods involved in the search for new specific antiviral compounds or in the identification of new therapeutic strategies are lengthy and complex processes that may take anywhere between three to five years. In this context, drug repurposing has appeared as a rather relevant and potentially useful strategy to search for drugs approved for the treatment of other diseases and, in particular, COVID-19 (Rodrigues *et al.*, 2022). More precisely, it has been identified that some existing drugs can be usefully employed to treat SARS-CoV-2 infection and are already under clinical trial (Zhan Yu & Ouyang 2022). More than 100 distinct drugs initially repurposed for COVID-19 were advanced to clinical trials between January 2020 and December 2021. Four drugs received approval or emergency use authorisation from the FDA, whereas an additional 15 drugs were recommended by the National Institutes of Health or the Infectious Diseases Society of America for off-label use. Remdesivir is classified as a nucleoside analogue. Remdesivir is also called Veklury. It should be mentioned that the aforementioned drug has not been approved by the Food and Drug Administration. Yet, for COVID-19 patients, the EUA was issued in 2020 for those who experienced severe symptoms of the virus (Govender & Chuturgoon, 2022).

Some examples of repurposed drugs: There are examples of abandoned drugs with their toxicity resurfaced for different indications. Thalidomide, which was prescribed for vomiting in pregnant women, resulted in several congenital disabilities. Because of this terrible impact on foetal development, its use was prohibited or controlled in several countries. Later, the drug was repurposed for the treatment of leprosy and multiple myeloma (Kulkarni *et al.*, 2023). Off-target repurposing depends on drug promiscuity or, more accurately, polypharmacology, i.e., a drug is active on multiple targets, and the secondary targets may be harnessed for other indications (e.g., cimetidine—a peptic ulcer drug repurposed for lung cancer) (Ayyar *&* Subramanian 2022). Minoxidil is a drug that was repositioned as well as reformulated. Minoxidil is an oral formulation, and its use has been known to result in the treatment of severe hypertension. While being used clinically, hair growth was reported as a side effect of Minoxidil. This finding led to the subsequent development of a topical Minoxidil formulation for the treatment of androgenetic alopecia (Okuyama 2023).

The aim of the project is to identify new therapeutic indications for established medications originally developed for a different purpose.

Methodology

A cross-sectional hospital-based study titled "Identification of Established Drugs for Contemporary Indications" was conducted over six months at a tertiary care hospital with specialised departments including Neurology, Cardiology, Nephrology, Obstetrics, Gastroenterology, Orthopaedics, General Medicine, General Surgery, and Pulmonology. The study focused on patients aged 18–60 years and aimed to meticulously analyse case sheets for identifying contemporary indications of established drugs. Case sheets were cross-referenced with the prescribed treatments, comparing subjective and objective evidence. Case sheets aligning with either subjective or objective evidence were excluded, while drugs not meeting these criteria were included as potentially contemporary-indicated drugs. Identified drugs were further analysed to assess their category, dosage, and frequency compared to existing treatments. The study was conducted at Santhiram Medical College and General Hospital, Nandyala, after obtaining approval from the institution's Human Ethics Committee. Based on inclusion and exclusion criteria, the target sample size was set at 157, with an inclusion criterion such as patients prescribed established drugs for contemporary indications, patients willing to join the study with prior informed consent, and patients receiving other medications for comorbid conditions. The exclusion criterion included patients unwilling to join the study and those not willing to give written informed consent. The analysis was conducted using DATAtab software, 2019.1 version, to ensure accurate and comprehensive statistical evaluation. The results were analysed and proportionally tabulated.

Ethical Statement

The study has been approved by the Institutional Ethics Committee (IEC) of Santhiram Medical College and General Hospital, Andhra Pradesh, India with the Certificate of Approval (Ref. No. IEC/SRMC/SRCP/RESEARCH/006/2023), dated 29.08.2023.

Results

Table 1: Established drugs with their old and new indications

Drugs	Old Indication	New Indication
Dapagliflozin	Manage Type 2 Diabetes Mellitus	Improves ejection fraction
Tadalafil	To treat erectile dysfunction	Treat pulmonary arterial hypertension
Aspirin	To treat pain and inflammation	Reduces the formation of blood clots
Ursodeoxycholic acid	To treat liver diseases	Treat respiratory distress
Flupirtine maleate	To treat pain and muscle spasms	Prevent apoptosis
Atorvastatin	To treat hyperlipidaemia	Promote angiogenesis
Sildenafil	To treat erectile dysfunction	Treat pulmonary arterial hypertension
Gabapentin	To treat convulsions	Treat neuropathic pain
Levetiracetam	To treat convulsions	Forms complex with free haem molecule and prevents haem-induced toxicity

Table 2: Total number of observed prescriptions for contemporary indications

Drugs	Total number of observed prescriptions with new indications	Percentage
Aspirin	43	27.39%
Atorvastatin	33	21.01%
Gabapentin	18	11.47%
Dapagliflozin	38	24.20%
Levetiracetam	8	5.09%
Sildenafil	1	0.64%
Tadalafil	2	1.28%
Ursodeoxycholic acid	6	3.82%
Flupirtine maleate	8	5.09%

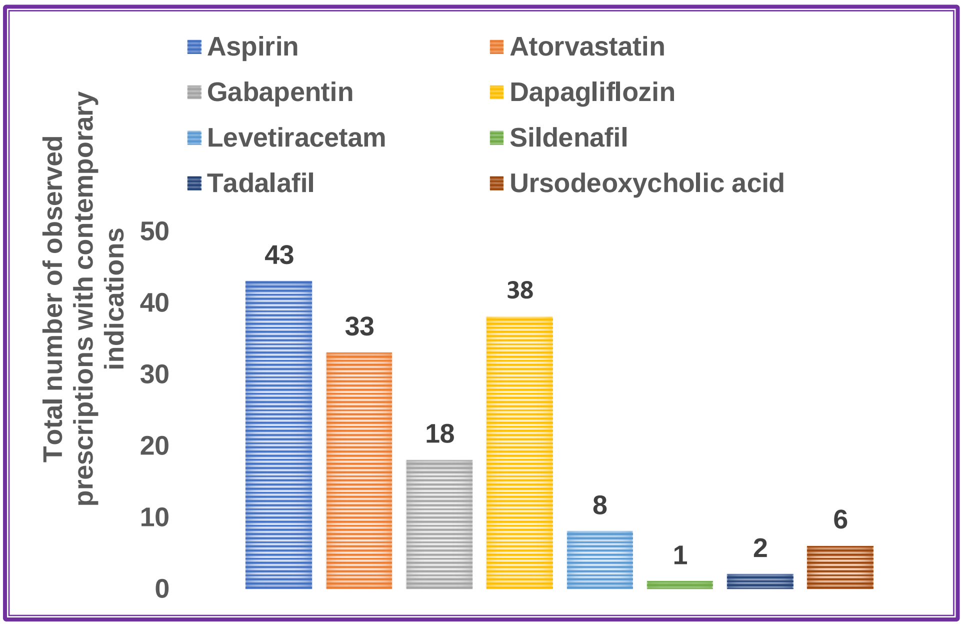

Figure 1: Total number of observed prescriptions for contemporary indications

Table 3: Gender-wise prescription of established drugs for contemporary indications based on various departments

Departments	Drugs	Female	Male
Cardiology	Aspirin	16	27
	Dapagliflozin	14	24
	Tadalafil	2	-
Neurology	Atorvastatin	12	21
	Gabapentin	6	12
	Levetiracetam	1	7
Pulmonology	Flupirtine maleate	2	6
	Ursodeoxycholic acid	1	5
Nephrology	Sildenafil	1	-
Total		55	102

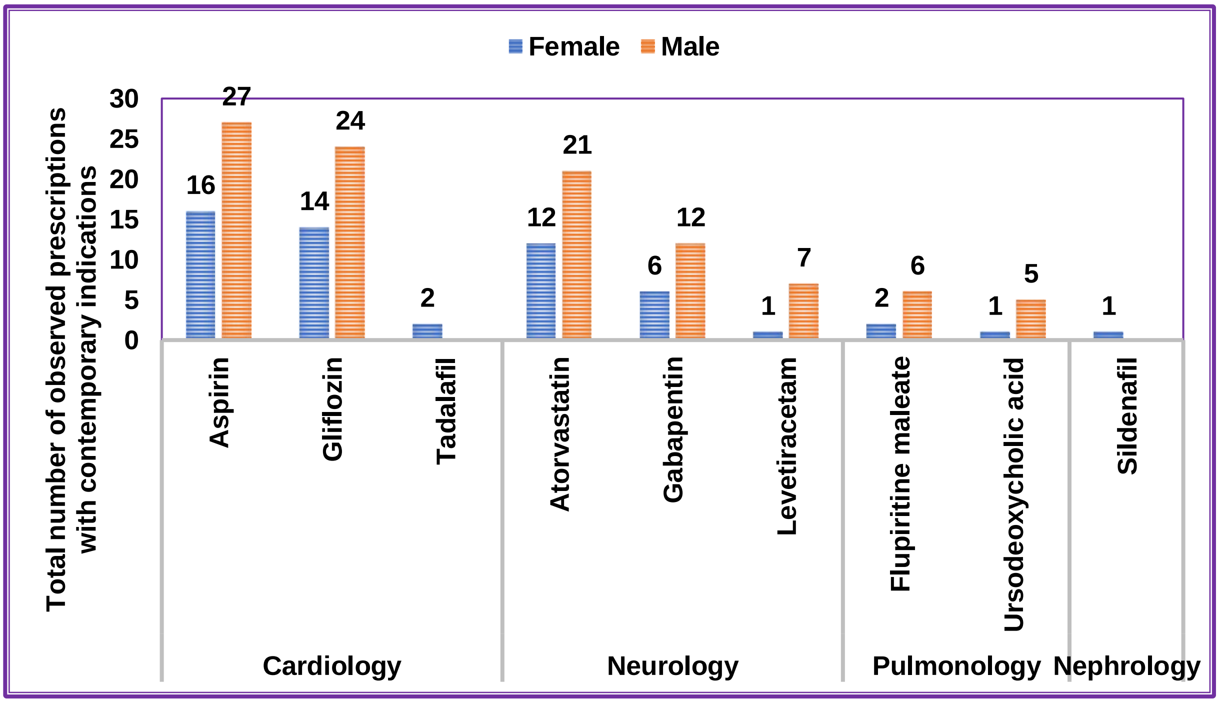

Figure 2: Gender-wise prescription of established drugs for contemporary indications based on various departments

Table 4: Established drugs with their old and new categories

Drugs	Old Category	New Category
Dapagliflozin	Sodium-glucose co-transporter 2 (SGLT2) inhibitor	Cardio protectant
Aspirin	NSAID	Anti-platelet
Tadalafil	PDE5 Inhibitor	PDE5 Inhibitor
Flupirtine maleate	Non opioid analgesic	Anti-Apoptotic agent
Ursodeoxycholic acid	Hepatoprotective agent	Respiratory protectant
Gabapentin	Anti-convulsant	Anti-neuralgic
Atorvastatin	HMG COA reductase inhibitor	Neuro protectant
Sildenafil	PDE5-Inhibitor	PDE5-Inhibitor
Levetiracetam	Anti-Convulsant	Neuro protectant

Table 5: Dosage patterns of well-established drugs exhibiting contemporary indications

Drugs	Recommended Old Dose	Recommended New Dose
Flupirtine maleate	100mg	100mg
Ursodeoxycholic acid	150-450mg	300mg
Gabapentin	100-3600mg	100mg
Levetiracetam	500-3000mg	500mg
Atorvastatin	10-80mg	40mg
Aspirin	325mg	75mg & 150mg
Tadalafil	10mg & 20mg	10mg
Sildenafil	25mg	25mg
Dapagliflozin	10mg	10mg

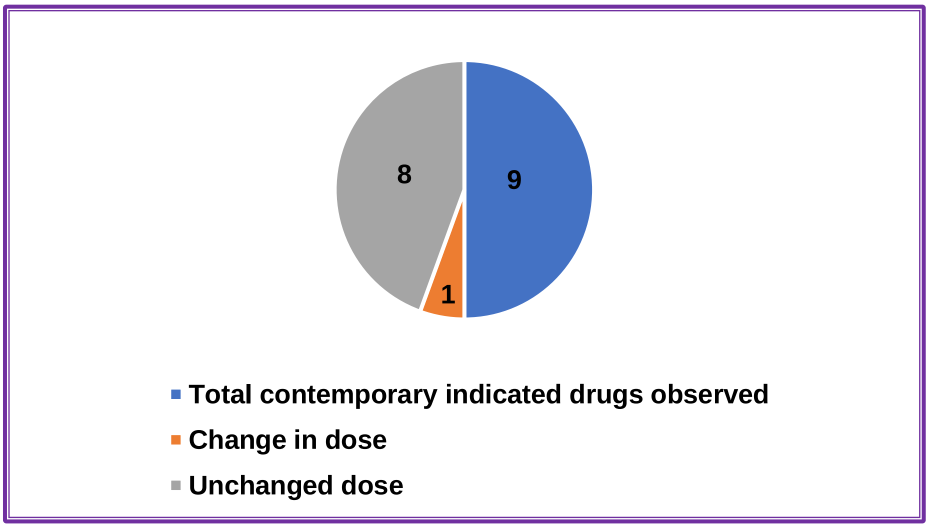

Figure 3: Contemporary indicated drugs with their change and unchanged dose

Table 6: Established drugs with their old and new frequencies

Drugs	Recommended Old Frequency	New Frequency
Dapagliflozin	O.D – manage Type 2 Diabetes Mellitus	O.D - improves Ejection fraction
Aspirin	T.D – to treat pain and inflammation	O.D – reduces the formation of blood clots
Tadalafil	O.D - treat erectile dysfunction	O.D - treat pulmonary arterial hypertension
Flupirtine maleate	B.D – to treat pain and muscle spasms	B.D - prevent apoptosis
Ursodeoxycholic acid	B.D - treat liver related diseases	B.D - treat respiratory distress
Gabapentin	T.D - treat convulsions	T.D - treat neuropathic pain
Atorvastatin	O.D - lowering cholesterol levels	O.D - to promote angiogenesis
Sildenafil	O.D – treat erectile dysfunction	T.D - treat pulmonary arterial hypertension
Levetiracetam	B.D - treat convulsions	B.D - reduces neuro toxicity

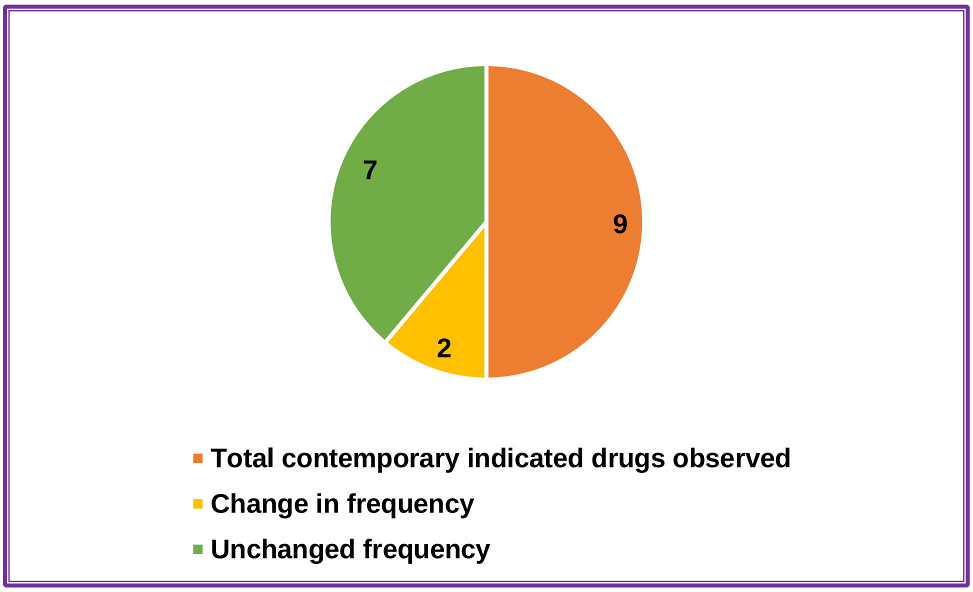

Figure 4: Contemporary indicated drugs with their change and unchanged frequency

Table 7: Drugs are prescribed based on symptoms and objective evidence

Drugs	Prescribed drugs	Based on symptoms	Objective evidence
Aspirin	43		43
Dapagliflozin	38		38
Atorvastatin	33		33
Tadalafil	2		2
Sildenafil	1		1
Levetiracetam	8		8
Gabapentin	18	18	-
Ursodeoxycholic acid	6		6
Flupirtine maleate	8		8

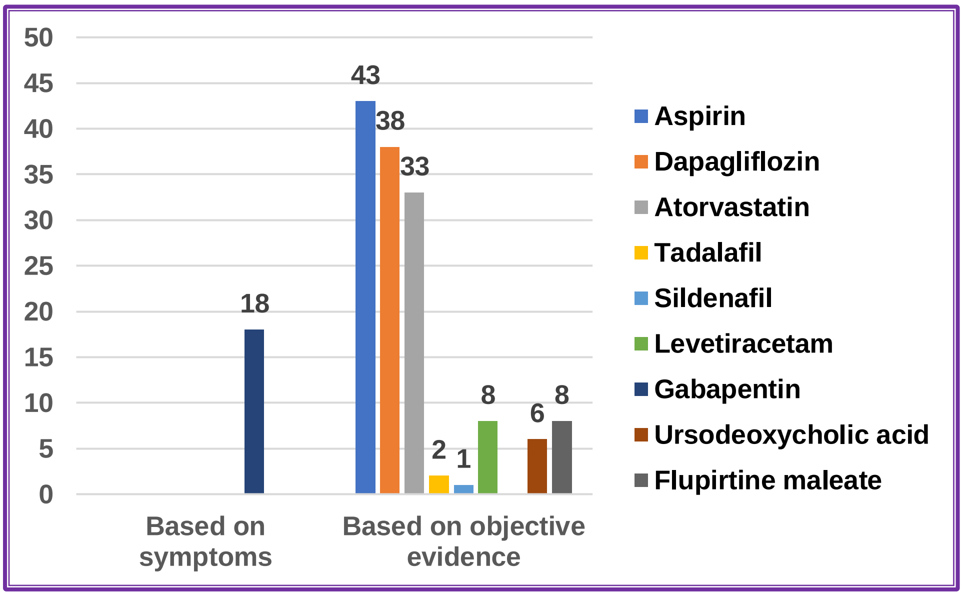

Figure 5: Drugs are prescribed based on symptoms and objective evidence

Table 8: Drugs are prescribed based on lab investigations

Drugs	Investigations (Subjective or objective)	Old indication	Investigations (Subjective or objective)	New Indication
Aspirin	Symptoms (mild to moderate pain)	NSAID	BT, CT, Angiography, Doppler ultrasound	Reduces the formation of blood clots
Atorvastatin	LDL	Treat hyperlipidaemia	CT, MRI, USG, CRP	Promote angiogenesis
Dapagliflozin	Fasting blood glucose, HbA1c, OGTT	Manage Type 2 Diabetes Mellitus	2D Echo	Used to increase EF (<40%)
Gabapentin	Electroencephalogram (EEG)	Anti-convulsant	Symptoms (burning pain, shooting pain, tingling and numbness)	To treat neuropathic pain
Sildenafil	Symptoms-based considerations (Symptoms of erectile dysfunction) Objective evidence-based considerations (Blood tests to check hormone levels, imaging studies, or vascular studies to identify any physiological factors contributing to erectile dysfunction)	Erectile dysfunction)	X-ray	To treat Pulmonary arterial hypertension
Tadalafil	Symptoms-based considerations (Symptoms of erectile dysfunction) Objective evidence-based considerations (Blood tests check hormone levels, imaging studies, or vascular studies to identify any physiological factors contributing to erectile dysfunction.	Erectile dysfunction	X-ray	To treat Pulmonary arterial hypertension
Levetiracetam	Electroencephalogram (EEG)	Anti-convulsant	CT scan, MRI	Forms complex with free haem molecule and prevents haem-induced toxicity
Ursodeoxycholic acid	LFT, imaging studies such as ultrasound or MRI, and Liver biopsy	Liver protectant	RF-ABG	Treat respiratory distress
Flupirtine maleate	Based on symptoms (Pain)	Muscle relaxant	SP02	Prevent apoptosis

Table 9: Disease-wise prescription of established drugs for contemporary indications based on various departments

Departments	Diseases	Frequency of Prescription	Total Number of Drugs
Cardiology	NSTEMI	65	83
	Refractory heart failure	7	
	IWMI	3	
	AWAMI	8	
Neurology	CVA with Ischemic stroke	57	59
	Paraesthesia on both lower limbs	1	
	CVA with haemorrhagic stroke	1	
Nephrology	HTN with ADPKD with CKD on MHD	1	1
Pulmonology	Pneumonia with Type-1 Respiratory failure	3	14
	Type-1 Respiratory failure	9	
	Small cell carcinoma of the right lung with Cor Pulmonale	1	
	BronchiectasisType-1 Respiratory failure	1	

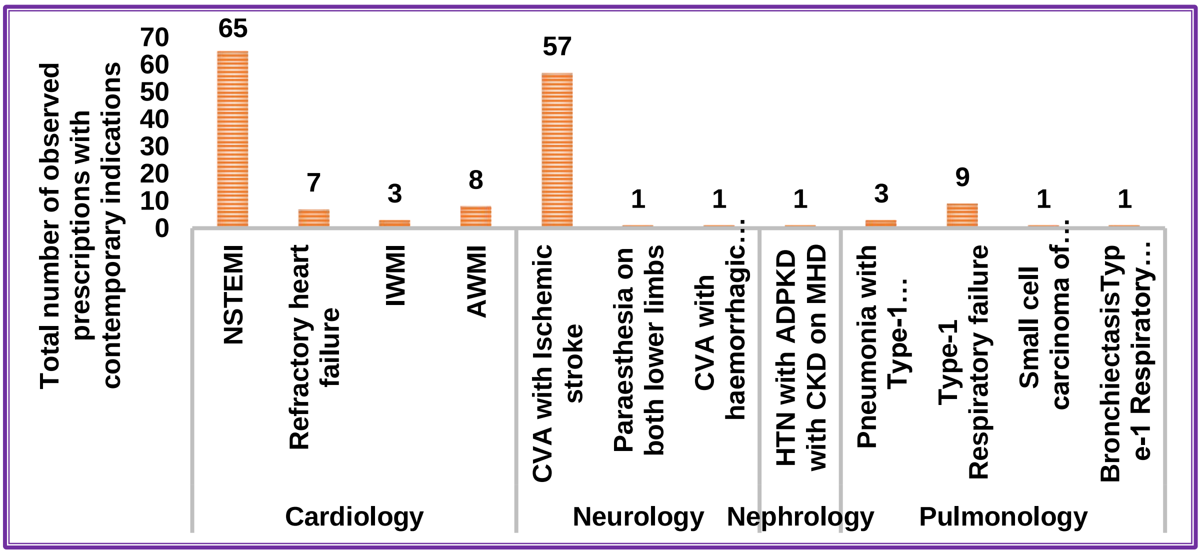

Figure 6: Disease-wise prescription of established drugs for contemporary indications based on various departments

Table 10: Disease-wise prescription of established drugs for contemporary indications

Diseases	Aspirin	Dapagliflozin	Atorvastatin	Gabapentin	Levetiracetam	Sildenafil	Tadalafil	Ursodeoxycholic acid	Flupirtine maleate
NSTEMI	37	26					2		
Refractory heart failure		7							
IWMI	2	1							
AWMI	4	4							
Ischemic stroke			33	17	7				
Paraesthesia on both LL				1					
Hemorrhagic stroke					1				
HTN with ADPKD with CKD on MHD						1			
Pneumonia with Type 1 Respiratory failure									3
Type 1 Respiratory failure								5	4
Small cell carcinoma of the right lung with Cor pulmonale								1	
Bronchiectasis Type-1 RF									1

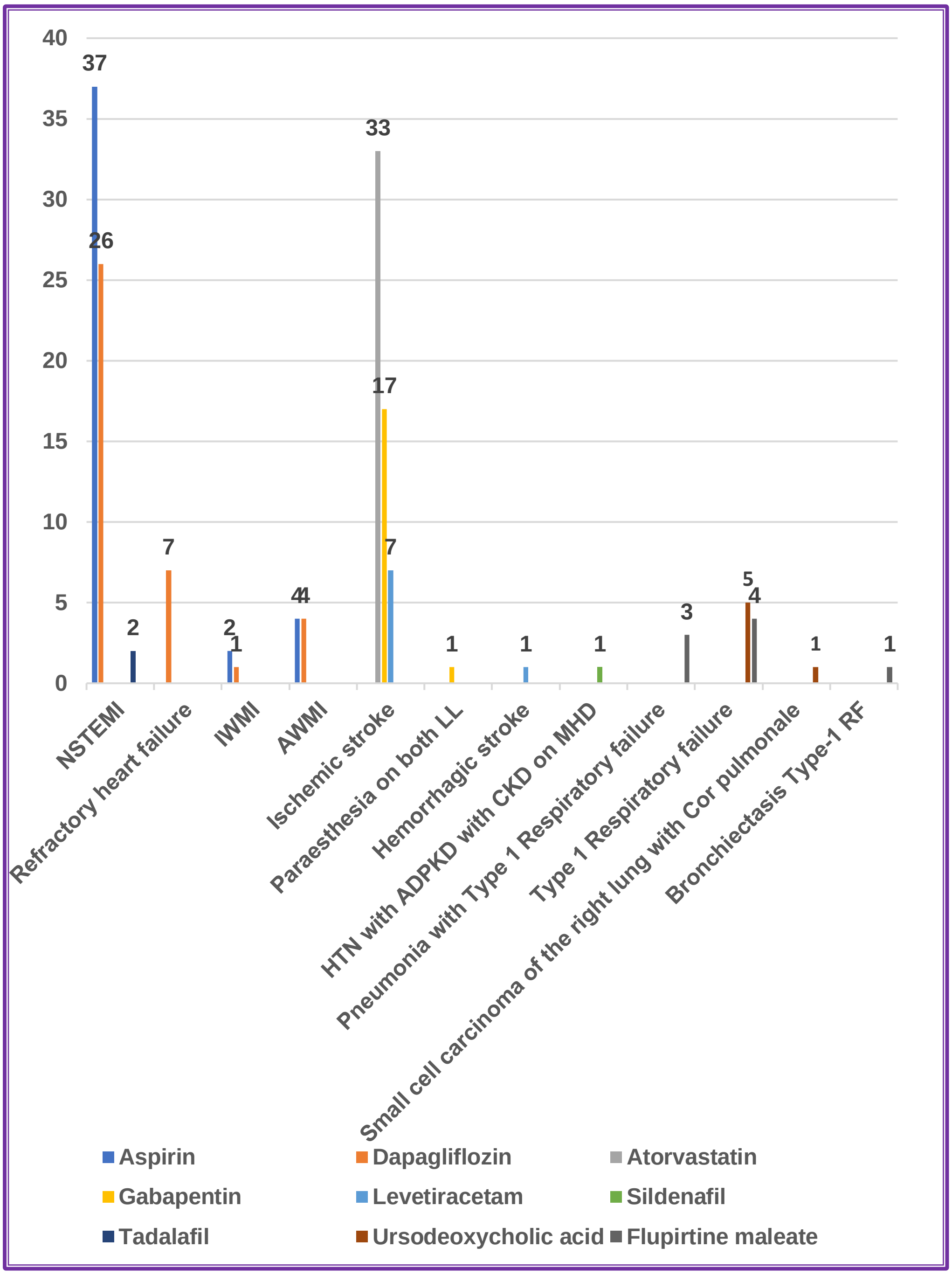

Figure 7: Disease-wise prescription of established drugs for contemporary indications

In this study, a total of 157 case files were analysed, encompassing nine different drugs: Aspirin—43 cases (27.39%), Atorvastatin—33 cases (21.01%), Gabapentin—18 cases (11.47%), Dapagliflozin—38 cases (24.20%), Levetiracetam—8 cases (5.09%), Sildenafil—1 case (0.64%), Tadalafil—2 cases (1.28%), Ursodeoxycholic Acid—6 cases (3.82%), and Flupirtine Maleate—8 cases (5.09%). These were categorised as demonstrating contemporary indications during the six-month study period at the tertiary care teaching hospital (Table 2 and Figure 1).

The study examined the gender-specific prescription patterns of established drugs for contemporary indications across various departments. Analysis of the 157 case files revealed a predominance of contemporary indications in male patients, with 120 cases compared to 55 in females. The cardiology department recorded the highest number of male patients prescribed established drugs for contemporary indications (Table 3 and Figure 2). Similar findings are reported in Western societies, where ischemic heart diseases occur 7–10 times later in women than in men. Men are approximately 3–4 times more likely than women to suffer from ST-elevated myocardial infarction (STEMI) or NSTEMI, as reported in a study by Suman *et al.* (2023).

In the study, we identified 8 cases (5.09%) involving the administration of Levetiracetam for conditions such as ischemic stroke (7 cases) and haemorrhagic stroke (1 case) (Table 2 and Table 10, Figure 7). This drug was prescribed to patients without a history of epileptic seizures. Emerging literature suggests Levetiracetam may exhibit neuroprotective effects independent of its conventional antiepileptic properties (Table 1). Levetiracetam mitigates neuronal excitability and excessive neurotransmitter release, thereby reducing neurotoxicity. It also lessens the accumulation of neural damage caused by various neurotoxic insults, making it a suitable candidate for repurposing as a neuroprotective agent (Table 4). Yao *et al.* (2021) concluded that Levetiracetam treatment significantly reduced infarct size and increased the density of remaining neurons in the cerebral cortex. Importantly, no adjustments were required in dosage or administration frequency when repurposed for neurological applications, ensuring feasibility without disrupting established therapeutic regimens (Table 5 and Table 6, Figure 4).

Gabapentin was administered in 18 cases (11.47%) for conditions such as ischemic stroke (17 cases) and paraesthesia in both lower limbs (1 case) (Table 2, Figure 1 and Table 10, Figure 7), despite no history of epilepsy. Pharmacological studies demonstrate Gabapentin's effectiveness in treating neuropathic pain. It binds to voltage-gated calcium channels in the central nervous system, inhibiting excitatory neurotransmitter release and attenuating pain perception. Gabapentin's evolution from an antiepileptic agent to a recognised treatment for neuropathic pain exemplifies the potential of drug repurposing (Table 4). Rosenberg *et al.* (1997) observed significant pain reduction in patients with neuropathic pain, particularly postherpetic neuralgia. Notably, dosage and frequency remain consistent for both epilepsy and neuropathic pain management (Table 5, Figure 3 and Table 6, Figure 4).

Atorvastatin was administered in 33 cases (21.01%) for ischemic stroke (Table 2, Figure 1 and Table 10, Figure 7). While traditionally used for lowering cholesterol levels and reducing cardiovascular event risks, emerging evidence highlights Atorvastatin's angiogenic properties. Angiogenesis plays a critical role in wound healing, tissue repair, and the formation of new blood vessels. Michael Weis *et al.* (2002) demonstrated that statins exhibit proangiogenic effects at low concentrations. Despite this new therapeutic potential, the prescribed dose for lipid-lowering remains unchanged for angiogenic applications (Table 5, Figure 3 and Table 6, Figure 4).

Dapagliflozin was administered in 38 cases (24.20%) for conditions such as NSTEMI (26 cases), refractory heart failure (7 cases), anterior wall myocardial infarction (4 cases), and inferior wall myocardial infarction (1 case), despite no history of diabetes mellitus (Table 2, Figure 1 and Table 10, Figure 7). This finding supports Dapagliflozin's role in improving ejection fraction and cardiac function, extending its use from an anti-diabetic agent to a cardioprotective intervention. Solomon *et al.* (2022) concluded that Dapagliflozin significantly reduced cardiovascular mortality or heart failure in patients with preserved or moderately reduced ejection fraction. Dosage and frequency remain consistent across its therapeutic applications (Table 5, Figure 3 and Table 6, Figure 4).

Ursodeoxycholic Acid (UDCA) was prescribed in 6 cases for type-1 respiratory failure (5 cases) and small cell carcinoma with RL (1 case) (Table 2, Figure 1 and Table 10, Figure 7). Traditionally a biliary agent, UDCA demonstrated potential in mitigating respiratory-related conditions by modulating inflammatory pathways and cytokine release. Niu *et al.* (2020) noted UDCA's ability to reverse cytoskeleton protein reorganisation, mitigating lung injury. Dosage and frequency remain consistent across indications (Table 5, Figure 3 and Table 6, Figure 4).

Tadalafil and Sildenafil were administered in 2 and 1 cases, respectively, for pulmonary arterial hypertension (PAH) (Table 2, Figure 1 and Table 10, Figure 7). These drugs, typically used for erectile dysfunction, demonstrated efficacy in reducing pulmonary vascular resistance via PDE5 inhibition. Henrie, Nawarskas and Anderson (2015) observed improvements in exercise capacity with tadalafil.

Sildenafil dosage adjustments were required, increasing from once daily to thrice daily for PAH treatment (Table 5 and Table 6, Figure 4).

Flupirtine Maleate was prescribed in 8 cases for bronchiectasis with type-1 respiratory failure (1 case), pneumonia with type-1 respiratory failure (3 cases), and type-1 respiratory failure (4 cases) (Table 2, Figure 1 and Table 10, Figure 7). Known as an analgesic, Flupirtine Maleate was observed to have anti-apoptotic properties, inhibiting apoptotic enzymes and promoting cell survival signals. Harish *et al.* (2012) highlighted its potential in treating neurodegenerative diseases. Dosage and frequency were consistent across indications (Table 5, Figure 3 and Table 6, Figure 4).

Aspirin was prescribed in 43 cases for NSTEMI (33 cases), ischemic stroke (4 cases), anterior wall myocardial infarction (4 cases), and inferior wall myocardial infarction (1 case), in the absence of pain or inflammation (Table 2, Figure 1 and Table 10, Figure 7). Its antiplatelet effects, achieved by inhibiting cyclooxygenase enzymes, were evident. Eikelboom *et al.* (2012) observed reduced stroke and cardiovascular events at low doses. Dosage adjustments were made, shifting from higher analgesic doses to lower, once-daily doses for antiplatelet therapy (Table 5, Figure 3 and Table 6, Figure 4).

Discussion

The study meticulously examined the data, specifically focusing on the number of case files exhibiting contemporary indications. In a cross-sectional hospital-based study, "Identifying repurposed drugs involves a comprehensive assessment of the patient's case sheet. Cross-referencing the prescribed treatment with subjective and objective evidence can exclude the case sheet that aligns with either subjective or objective evidence. Conversely, any drugs that do not meet the requirements are included in the study as contemporary indicated drugs. Following the identification of a contemporary indicated drug, we assess its category, doses, and frequency against those of existing drugs. The results showed that we identified 157 case files with nine different types of contemporary indicated drugs. Among the modern drugs listed—Dapagliflozin 38 (21.01%), Atorvastatin 33 (21.01%), Ursodeoxycholic acid 6 (3.82%), Aspirin 43 (27.39%), Sildenafil 1 (0.64%), Flupirtine maleate 8 (5.09%), Tadalafil 2 (1.28%), Gabapentin 8 (11.47%), Levetiracetam 8 (5.09%). The highest frequency was attributed to Aspirin, with Dapagliflozin closely behind. An analysis of these drugs reveals notable shifts in their categorisation, dosage, and frequency of use from older indications to newer ones. Of the nine drugs identified, seven have transitioned to new indication categories. Aspirin, Atorvastatin, Dapagliflozin, Flupirtine maleate, Ursodeoxycholic acid, Gabapentin, and Levetiracetam are the medications whose categories have changed; Sildenafil and Tadalafil have remained the same. Moreover, one medication exhibited a change in its recommended dosage, even though most of the medications kept their dosage schedules between the old and new indications. The drug that changed the dose was Aspirin. Of the nine drugs identified, two exhibited changes in frequency from old indications to new indications. The drugs that have changed in frequency are Aspirin and Sildenafil. Studies like the ASCEND trial (2018), which highlighted Aspirin's significance in cardiovascular protection, also showed that Aspirin's dosage changed significantly, emphasising its shifting clinical applications. Furthermore, studies reported in *Circulation* (2021) validated the findings that two medications, Sildenafil and Aspirin, exhibited changes in frequency of use while switching from older to newer indications, which is consistent with revised clinical guidelines as well as emerging data. With significant ramifications for patient care, these findings highlight the dynamic nature of pharmacological repurposing. The switch to modern indications for a number of medications demonstrates the progress made in pharmacological knowledge and the impact of fresh data on prescription procedures. The long-term safety and effectiveness of these repurposed medications should be further assessed in future studies in order to ensure their best use in clinical settings.

Conclusion

The study examined more than a thousand case sheets to identify well-known medications with potential novel therapeutic applications. Prescription medications that did not precisely align with subjective or objective findings were included by comparing them to patient symptoms and clinical data. Nine medications were identified across 157 cases, including Aspirin (27.39%), Dapagliflozin (24.20%), Atorvastatin (21.01%), and Gabapentin (11.47%). The results revealed changes in drug categories, usage patterns, and tailored dosages. The study highlights drug repurposing as a cost-effective alternative to traditional drug development.

However, certain limitations were encountered, including incomplete data on drug interactions and risks associated with off-label use, such as side effects and contraindications that are not fully understood. Furthermore, additional clinical validation is required to ensure the safety and efficacy of these repurposed drugs. Looking to the future, advancements in AI, computational drug discovery, and personalised medicine present significant opportunities to refine and expand the use of these medications. This study serves as a stepping stone towards realising the full potential of drug repurposing, ultimately benefiting both healthcare systems and patients.

Conflict of Interest

The authors declare that there is no conflict of interest.

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