"TO CONDUCT MARKET RESEARCH ON FESOBIG IN UROLOGY"

Dissertation Submitted to

The IIHMR University, Jaipur

for the partial fulfillment for the award of the degree of Master of Business Administration (MBA)

in

Pharmaceutical Management by

AMOL PATIL

Under the Supervision and Guidance of

Dr. SUDHINDER SINGH CHOWHAN

Associate Professor

School of Pharmaceutical Management IIHMR University, Jaipur

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DECLARATION BY STUDENT

I hereby declare that this dissertation titled "To conduct market research on fesobig in urology" is the bonafide record of my original research work. I declare that it has not been shared with any other university or institution for the award of any degree or diploma. Information derived from published or unpublished work from others has been duly acknowledged in the text.

Name of the student: **Amol Patil**

Date: 03-06-2023

ABSTRACT:

Overactive bladder (OAB) is a common condition, with prevalence rates increasing with advancing age. Symptoms of OAB, including urgency urinary incontinence (UUI), are associated with various co-morbidities in elderly individuals (e.g., falls and fractures, functional impairment, and depression). The current mainstay of pharmacological therapy for OAB is antimuscarinic agents. The few studies had specifically evaluated the efficacy and safety of antimuscarinics in the treatment of OAB symptoms in elderly patients. Fesobig is a anti-muscarinic receptor agent which works in the patients with OAB with better safety, tolerability and efficacy. Fesobig is the first launched drug in the category of OAB by MSN Laboratories., so this is new molecule for the OAB Patients in India. And that's why doctors are hesitated to prescribe new molecules. The good news is that as I worked in Hyderabad and here doctors are prescribing Fesobig for ten days so they can try the products. After ten days of therapy with Fesobig 8 mg taken by patients the result obtained was showing dry mouth in patients, but Fesobig 4mg shows that beneficial results in OAB patients.

ACKNOWLEDGEMENT

I would like to express my sincere gratitude and appreciation to all those who have supported me throughout the completion of this dissertation. Without their assistance, encouragement, and guidance, this accomplishment would not have been possible.

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Name of the student: **Amol Patil**

Date: 03-06-2023

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

	List of Abbreviations
OAB	Overactive Bladder
SOFIA	Study Of Fesoterodine in an Aged population
SUI	Stress Urinary Incontinence
HMT	Histone Methyltransferase Inhibitor
UUI	Urge Urinary Incontinence
CYP2D	Cytochrome P450 2D6
MRHD	Maximum Recommended Human Dose
HRQOL	Health-Related Quality of Life
CrCl	Creatinine clearance
AE	Adverse Events
ECG	Electrocardiogram

Chapter 1: INTRODUCTION

OAB is a common ailment in which a person feels the need to urinate so frequently that it significantly interferes with their daily activities. Regular urination may be required throughout the day, at night, or both. Urge incontinence is the medical term for when there is a loss of bladder control. Approximately 11% of the population suffers with overactive bladder, and more than 40% of these individuals experience incontinence. Conversely, an overactive bladder causes between 40% and 70% of urine incontinence. Although overactive bladder is not a life-threatening disorder, the majority of those who have it struggle for years.

Overactive bladder has no recognized aetiology. Obesity, coffee use, and constipation are risk factors. Chronic pelvic pain, poorly functioning mobility, and poorly controlled diabetes may make the symptoms worse. Before seeking therapy, people frequently experience the symptoms for a long period, and carers may occasionally recognize the problem. The diagnosis is made based on all of the patient's symptoms and other infections or neurological diseases if they have any. Every time you urinate, you only pass a small amount of urine. Urination pain indicates an issue other than an overactive bladder.

Symptoms of OAB:

An array of symptoms are represented by overactive bladder. The following symptoms are among them:

- Urgeness. Urinary urgency is a sudden, overwhelming urge to urinate. You only have a brief window of time to reach a loo once the urge to urinate strikes.
- Regular urination. You have to use the loo more frequently than usual if you frequently need to urinate.
- Incontinence is urgent. Urge incontinence is a sudden, irrational urge to urinate that could result in urine leakage.
- Nocturia: Nocturia is the urge to get up at least twice during the night to use the loo.

Causes:

OAB may have several reasons, and the exact cause is unknown. It is frequently linked to excessive detrusor urinae muscle activity. The lamina propria and urothelium, where aberrant contractions could cause the detrusor or the entire bladder to malfunction, are the source of the heightened contractile nature.

Catheter-related irritation

If bladder spasms occur or there is no urine in the drainage bag while a catheter is in place, the catheter could get blocked by blood, heavy sediment, a kink in the drainage tubing, or other factors. Spasms can occasionally is brought on by the catheter irritating the penis, prostate, or bladder. Although most people ultimately get used to the irritation and the spasms stop, such spasms can be managed with medicines like butylscopolamine.

A medication called fesobig contains the active ingredient fesoterodine. Both 4-mg and 8-mg prolonged-release pills are offered. Fesoterodine is released from the tablet gradually over a period of several hours and is known as prolonged release.

Fesobig treats symptoms in individuals with OAB syndrome: increased urinary frequency (desire to urinate more frequently), urgency (urgent want to pass urine), and urgency incontinence (urgent loss of control over urination). Only a prescription is required to buy the medication.

Chapter 2: REVIEW OF LITERATURE

Title of the Study	Author's name and Year	Learning
The most recent clinical data on the use of fesoterodine fumarate to treat elderly patients with overactive bladder	Wagg Adrian, 2012	OAB symptoms and OAB treatment options. Using fesoterodine to treat OAB, its therapeutic applications, safety, and effectiveness, and how it enhances quality of life
Treatment of Overactive Bladder Syndrome with Mirabegron.	Maria Vella & Linda Cardozo, 2022	Effects of OAB's rising incidence in an ageing population and the way anti-muscarinic drugs work to treat OAB
Review of the Cognitive Effects of Antimuscarinic Drugs Used to Treat Overactive Bladder in Elderly Patients.	Dustin, etal., 2011	Anti-muscarinic medication effects on cognition when treating OAB
Fesoterodine for overactive bladder	Gupta K, etal. 2010.	Fesoterodine is an effective and well-tolerated therapy option for OAB patients, according to a review of the literature.

Table 2.1: Review of Literature

Chapter 3: METHODOLOGY

Research Question:

- To know about various OAB therapies in the market and finding out the best suitable one.
- To find solutions to OAB for geriatric patients.
- To know about limitations of fesoterodine

Research Objective:

- In-depth learning of OAB
- To learn about treatments & criteria's for OAB
- Fesoterodine as a effective drug in treatment of OAB.
- Efficacy & Safety of fesoterodine in OAB patients
- 'Forta' Research of Fesobig
- SOFIA Trial

Study Area: Field knowledge about OAB and potency of Fesobig.

Study Design: Observational study

Study Tool: Review articles, Research articles, field work.

Study Duration: 90 days

Analysis: Population of OAB patients is geriatric. Various treatment regimens are available in the market but those are not effective & patient centric. Potency of fesobig as Forta Class 'B' category in OAB category, where other Indian company's product lies in Class 'C". I met around 147 Urologists in Hyderabad, surprisingly they gave positive responses about Fesobig. Which drug come under FORTA CLASS B is known for beneficial for Aged Patients.

Fesobig is the first launched drug in the category of OAB by MSN Laboratories., so this is new molecule for the OAB Patients in India. And that's why doctors are hesitated to prescribe new molecules.

The good news is that as I worked in Hyderabad and here doctors are prescribing Fesobig for ten days so they can try the products.

After ten days of therapy with Fesobig 8 mg taken by patients the result obtained was showing dry mouth in patients, but Fesobig 4mg shows that beneficial results in OAB patients.

What is OAB?

Overactive bladder (OAB) means collection of urine. It is not an illness. The most typical symptom is an unexpected, uncontrollable desire or need to urinate. When they experience this urge, some people will leak pee. The need to urinate frequently throughout day and night is another symptom. OAB is essentially the sensation of needing to use the loo excessively and urgently.

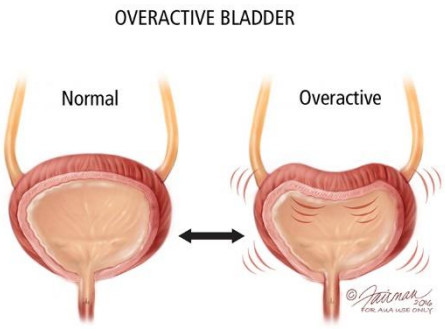

Figure 3.1: Overactive Bladder

"Incontinence" refers to the leaking of urine. Another typical bladder issue is stressing urinary incontinence (SUI). OAB is distinct from this. While laughing, sneezing, or engaging in other physical activities, people with SUI leak urine.

Overactive Bladder (OAB) And Anti Muscarinic

Overactive bladder (OAB) means urine urgency, which is commonly go along with frequency in urination and nocturia, with or without urgent excretion, without a UTI or any another obvious pathology.

In 2008, 10.7% of OAB cases were reported globally. Although no more epidemiological studies have been done subsequently, it was predicted that by 2018, a rising percentage of elderly people will make up the population, this prevalence would have increased to 20.1%. This amounts to a rise from 455 to 546 million in numbers over the course of a single decade.

OAB is associated with reduced job productivity, a significant impact on HRQoL, decreased sexual pleasure, and elevated levels of anxiety and melancholy. This affects active ageing in significant ways.

Currently, there are several ways to treat OAB, including traditional ones like lifestyle counselling and pelvis exercises to lessen urgency. These are followed by more severe techniques such medication, injections of botulinum toxin, stimulation of the lateral tibial nerve, and stimulation of the sacral nerve. Patients could proceed to more complicated surgeries like augmentation cystoplasty if these therapies are inadequate.

Anti-muscarinic drugs are currently the most often prescribed pharmacological treatments. These medications inhibit muscarinic M2 and M3 receptors to control the neuronal activity in the detrusor and urothelium. They also block muscarinic receptors in the brain, heart, salivary glands, tear ducts, and other organs, it might cause unpleasant side effects including diarrhoea, dry eyes, mouth gets dry, and impaired vision.

Relative intolerability may be to blame for these drugs' poor adherence and durability, which may result in early treatment termination. Furthermore, there is worry that prolonged high-dose exposure to anti-muscarinic medications can raise the risk of brain impairment, and memory loss, in geriatric people. 1

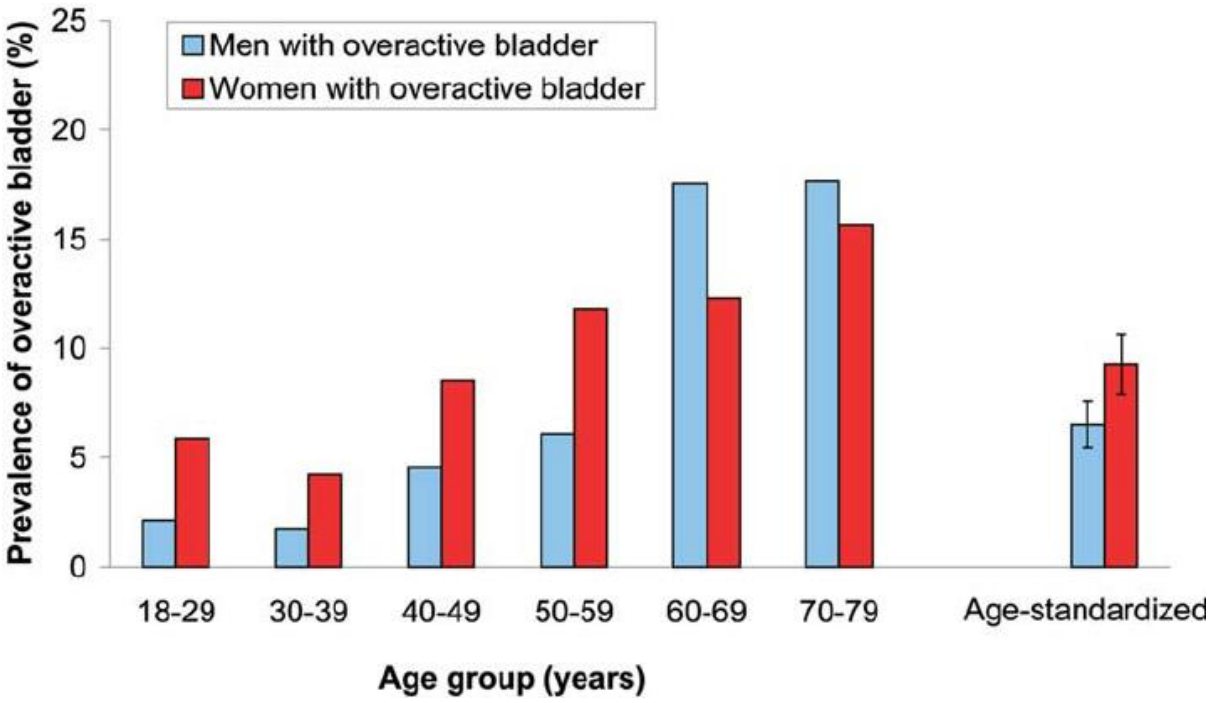

Figure no. 3.2: Prevalence of OAB

Key Statistics

In the USA, up to 30% males and 40% women suffer with OAB symptoms. Many OAB sufferers refuse to ask for assistance. They might experience shame. Many people either don't know how to discuss their symptoms with their doctor or they believe there are no therapies that will work.

How OAB Can Affect Your Life

OAB may interfere with your ability to exercise, sleep, socialise, or pursue your work. If OAB symptoms are not addressed, it may be difficult to go throughout the day without often stopping to use the loo. As a result, many people experience extreme loneliness.

OAB may have an impact on friendships and family ties. Your sleep and sexual life may be disturbed. Anyone who gets too little sleep will feel exhausted and down. Additionally, if you leak urine, you could get infections or skin issues.

OAB does not have to control your life. OAB is manageable. Consult your doctor if you believe you have OAB.

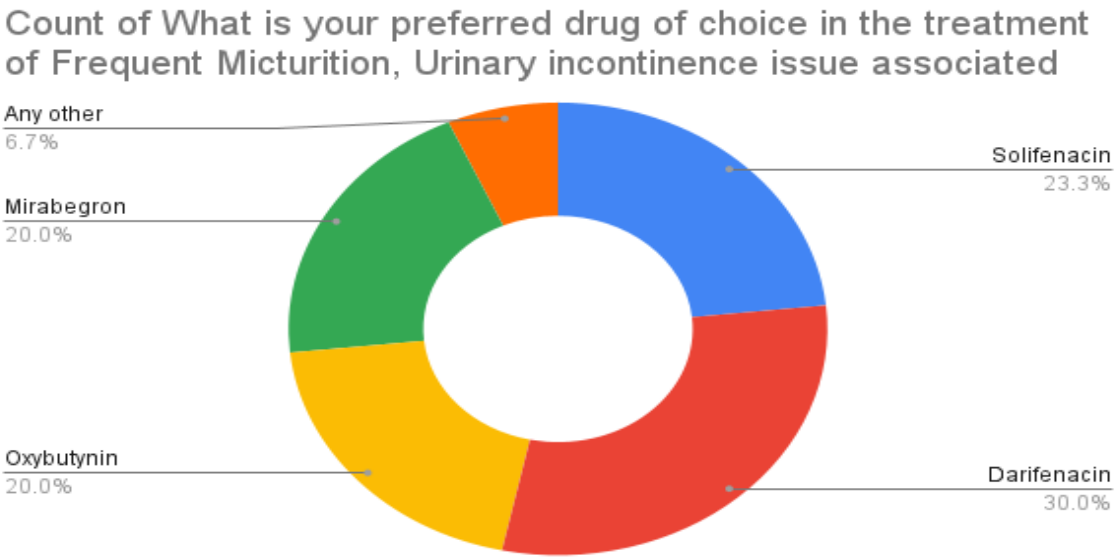

Figure 3.3: Depiction of preferred choice of drug for management of OAB

Symptoms:

Urgency: The main sign of OAB is an uncontrollable urge to urinate that comes on suddenly and strongly. If you don't immediately use the loo, you start to worry that you will leak. You might or might not actually leak as a result of this urge.

If you live with OAB, you may also:

Urination leaks or "urge incontinence." This means that when you suddenly feel the urge to urinate, urine spills. SUI, or stress urine incontinence, is not the same as this. When laughing, sneezing, or engaging in other physical activities, people with SUI lose urine.

to regularly urinate. You might need to use the loo frequently throughout the day. The frequency of urination differs from person to person. The term "frequent urination" refers to using the loo more than ten times in 24 hours.

To urinate at night, you must awaken. More than once waking up during the night to use the loo is a sign of noctouria or OAB.

Causes:

When the bladder is full of urine waste, the brain normally signals the bladder. The bladder's muscles then tighten. The outcome is that the urethra is used to drive the urine out. When the sphincter open up, urine spills out. When your bladder is empty, it is relaxed.

When your bladder is healthy, messages from your brain tell you when it is full or going close to being full so you can wait to use the loo. You need OAB right away. You have a sudden, strong want to leave. Even if your bladder isn't full, this can still occur.

OAB can happen if the nerve signals travelling from your brain to your bladder aren't functioning properly. Even when your bladder is not full, the signals may instruct you to empty it. OAB may also result from too active bladder muscles. The muscles in contract so that you may pass pee before it fills up. An instant, strong desire to urinate occurs from this. This is what we mean by "urgency."

Risk associated with OAB:

- Mental conditions or damage to the communications from your brain and bladder & vice versa.
- Changes in hormones/ hormonal imbalance
- Pelvic muscles get weakened
- UTI

- Drug AE Conditions that can harm the brain or spinal cord, such as multiple sclerosis and stroke and other conditions.

How the Urinary Tract Works Normally

- The vital mechanism in our bodies that eliminates liquid waste (urine) is the urinary tract. It consists of the organs that create, store, and excrete urine. Which are:
- Kidneys: two bean-shaped organs that produce urine and remove waste from the circulation.
- Two tiny tubes called ureters transport urine from the kidney to the bladder.
- Bladder: a muscle sac that resembles a balloon and stores pee until it's time to use the lavatory.
- Urethra: That takes out urine out of the body.
- The urethra contains a sphincter muscle, which closes to lock in pee and opens to release it when the bladder contracts.

Fesoterodine

Antimuscarinics are the cornerstone of OAB therapy. The US FDA approved the use of fesoterodine, a novel, competitive, nonselective muscarinic-receptor antagonist, in late 2008 to treat OAB and lessen the signs of urinary urge excretion, urgency in urination, and frequency in urination. By preventing acetylcholine from binding to muscarinic receptors, it reduces muscles in the bladder, that causes the bladder to store more urine and lowering the frequency of incontinence episodes. 2

Fesoterodine is an oral prodrug that, instead of using the hepatic cytochrome pathway, is quickly transformed into its metabolite that will be active, 5-HMT, by widespread esterase, primarily in oesophagus. This molecule can also be produced from tolterodine, but only through processes that call for the CYP2D6 enzyme to be active. Fesoterodine has the benefit of converting to 5-HMT in a way that makes levels of the active metabolite generally predictable and independent of CYP2D6 metabolizer status. Fesoterodine is rapidly and nearly completely metabolised, making it impossible to detect it in the bloodstream following oral administration. Both the bladder mucosa and the detrusor mucosa have muscarinic receptors that fesoterodine binds to. Compared to its parent chemical, 5-HMT has a muscarinic receptor affinity that is more than ten times greater. 5-HMT must be eliminated through hepatic metabolism using the CYPA4 and CYP2D6 enzymes. 1

Comparison of fesoterodine with other antimuscarinics:

Fesoterodine shares a lot of similarities with other antimuscarinics in terms of its mode of action. Its side effect profile is comparable. It has the same 5-HMT active metabolite as tolterodine. The primary distinction is that, following oral administration, only the metabolite can be seen in patients' serum since it is widely and quickly metabolised into its active metabolite. While fesoterodine does not require the CYP 2DP enzyme system for conversion into 5-HMT.

Darifenacin, ER oxybutynin, and solifenacin (available in doses of 5 and 10 mg each) are further antimuscarinics on the market that have the benefit of variable dosing. The capacity to adjust the drug dosage to the patient's symptoms is a benefit of flexible dosing.

Challenges Associated with Current Anti Muscarinic Treatment

Older patients usually have comorbidities that might reduce CNS permeability. The patients with these kind of problems regularly take additional drugs, which may alter consumption or increase the anticholinergic pressure, increases the risk of mental disorders. It is crucial to pick an antimuscarinic drug with a minimal chance of having an adverse CNS impact as a result.

Nonspecific esterases quickly and extensively metabolise the nonselective oral antimuscarinic medication fesoterodine to the metabolite 5-HMT. 5-HMT is responsible for the antimuscarinic actions that are present at therapeutic doses.

Since it does not depend on hepatic metabolism to function, fesoterodine has a lower potential for variability in individuals with liver impairment than other medications in its class.

The observed cognitive alterations are a result of the drugs' ability to cross the BBB and bind to muscarinic receptors in the CNS.

5-HMT appears to be less permeable across the BBB, suggesting that it may be a substrate for active transport by the P-glycoprotein transporter. With fesoterodine, there should be little possibility of harmful CNS consequences.

For the short time or long time, consequences of anti-muscarinic pharmaceutical use in senior populations at high risk, including individuals with various levels of cognitive impairment already present.3

Indications & Clinical Use

Fesoterodine is specially used for the treatment of OAB to lessen the symptoms of urge of excretion of urine, urgency in urination, and frequency in urination.4 The starting dose of fesoterodine is 4 mg one time in a day; But, the dosage may be raised to 8 mg one time in a day, depending on the patient's reaction and tolerance.5 Fesoterodine shouldn't be used in excess of 4 mg per day in individuals with severe renal problems (CrCl 30 mL/min) and those using potent CYF3A4 inhibitors such ketoconazole, itraconazole, and clarithromycin.

Geriatrics: Clinical studies found no discernible general differences in the safety of older (patients 65 years and older) and younger (patients 65 years) patients taking Fesobig extended-release tablets. As a result, altering the dose for elderly patients may not be essential.

Contraindications

Patients who have uncontrolled narrow-angle glaucoma, urine retention, or stomach retention should not take fesoterodine. Additionally, it should not be used in people who have significant impairment in hepatic or hypersensitivity that is known to the medication or any of its components.

Precautions

Patients with GI obstructive diseases (like pyloric stenosis), clinically significant bladder outlet obstruction (risk of urinary retention), decreased GI motility, such as constipation that is very high to severe, ulcerative colitis, toxic mega colon, myasthenia gravis, and glaucoma(narrow-anle), should proceed with caution.

Cardiovascular: Like other anti-muscarinic medications, fesoterodine is linked with increased heart rate that increases with dose. Fesoterodine belongs to the anticholinergic drug family, which is known to have cardiac adverse effects. However, there are no trials or other data to support the possibility that using fesoterodine might make some pre-existing cardiac conditions worse. When giving fesoterodine to patients who have IHD, CHF, Arrhythmia, or speeding up of heartbeat, prescribers should exercise care.

Endocrine/Metabolism:

- CYP3A4: Precautions should be taken, and patient should exercise while taking Fesoterodine or increasing the dose from 4 mg to 8 mg for people in whom an elevated exposure to the active metabolite is anticipated, such as with the CYP3A4 inhibitors. If a potent CYP3A4 inhibitor is present, it is not suggested to consume fesobig doses more

than 4 mg. When weak CYP3A4 inhibitors, such fluconazole, are present, no dose adjustments are indicated. Although the outcome of weak CYP3A4 inhibitors, like cimetidine, have still not well researched in clinical investigations, some pharmacokinetic interaction is predicted, albeit less so than that which was shown with moderate CYP3A4 inhibitors.

- CYP2D6: Not everyone can properly metabolise CYP2D6. Ketoconazole, a potent CYP3A4 inhibitor, was found to significantly enhance fesoterodine in CYP2D6 poor metabolizers compared to those who did not take it.
- Individuals Who May Experience in gastric retention. Fesobig should be taken with precautions in patients with impaired gastrointestinal motility, particularly who are suffering from GI diseases (such as pyloric stenosis), due to the likelihood of gastric retention.
- Patients at Risk for Urinary Retention: Genitourinary Due to the possibility of urine retention, Fesobig, like other antimuscarinic medications, should be used cautiously in individuals who have a clinically severe bladder outlet obstruction.
- Pancreas and liver: Patients who have compromised liver function should use fesobig with some warning. There is no need to change the dosage to patients with mild to moderate liver diseases. Patients with liver diseases should not take fesoterodine.
- Lactose: Lactose is a component of Fesobig extended-release tablets. A rare genetic disorder where galactose is not tolerated, the defeciency of lactase enzyme, or diseases which happens due to two molecules of glucose should not be treated with this drug..
- Immune: Fesoterodine has been associated with disease of the face, lips, tongue, and/or throat. Angioedema is occasionally developed following the first dose. Angioedema linked to swelling of the upper airways may be fatal. Fesoterodine should be stopped immediately if the tongue, hypopharynx, or larynx become involved, and the proper medications or precautions to guarantee a patient airway should be taken.
- Neurologic: Patients with myasthenia gravis should use fesobig and other antimuscarinic medications with caution.
- Controlled Narrow-Angle Glaucoma in ophthalmology. Patients receiving treatment for narrow-angle glaucoma should use fesobig and other antimuscarinic medications with extreme caution.
- Renal: Patients should take fesobig cautiously if their renal function is impaired. Patients who have severe to lower renal diseases do not require a dose adjustment.

Fesoterodine dosages larger than 4 mg shouldn't be given to patients with severe renal disorders (CrCl 30 mL/min).

Special Populations

Fesoterodine's effects on human sexual fertility is not yet studied. The effects on female fertility have been observed in mice exposed to toxic doses in pregnant condition at exposures ranging from 6 to 20 times those at the MRHD, however the therapeutic relevance of these animal results is unknown.

expecting mothers: fesoterodine in women who is pregnant is not supported by sufficient data. Humans may be at risk, but this is unknown. Only if the advantages to the mother exceed the hazards to the foetus may fesoterodine be used during pregnancy. Women who can become pregnant should be taken care using an effective form of contraception.

Breastfeeding is not advised while receiving therapy with fesoterodine

Paediatric: It is unknown whether Fesobig is safe and effective for use in children.

Geriatrics: Patients 65 years or lower showed no general differences in safety or effectiveness during the clinical trials. However, the participants in this research were carefully chosen and in generally good condition. Age has no discernible effect on the pharmacokinetics of fesoterodine. For senior patients, dose adjustment may not be necessary.

Dosage And Administration

Fesobig's beginning dose is advised to be 4 mg once regularly. The dose can be increased to by more mg one time in a day depending on the reaction & tolerance of each person.

The people who cannot take more than 4 mg of Fesobig per day:

• Individuals who experience severe renal disorders (CrCl 30 mL/min)

• People on strong CYP3A4 inhibitors & Patients with severe liver disorders should not be using fesobig. For people above 65 years old, dosage adjustment may not be required.

Fesobig pills should be swallowed whole and taken with a beverage. It is okay to take fesobig with or without food, however it shouldn't be chewed, chopped, or crushed. You can take fesobig either during the day or at night.

Overdosage

Fesoterodine overdose should be handled carefully to avoid severe antimuscarinic effects.

Gastric lavage and activated charcoal should be used to treat Fesoterodine overdoses. The following therapies are suggested for symptoms. A drug that inhibits cholinesterase, like physostigmine, may be used to treat severe central anticholinergic symptoms (hallucinations, extreme excitation). Give a patient an anticonvulsant, such as diazepam, if they experience excitement and convulsions. Respiratory support should be offered to patients who are respiratoryly insufficient. Patients who experience respiratory arrest need to be provided artificial respiration. A beta-blocker may be used to treat tachycardia in patients, and catheterization may be used to treat urine retention in patients. Patients with severe mydriasis may be sedated, given ocular drops containing pilocarpine, or both. ECG monitoring is necessary.

Flexible Dose Fesoterodine Significantly Improved OAB

Dose flexibility provides the benefit of individualised treatment planning to strike the ideal balance between efficacy and unfavourable side effects. Overactive bladder symptoms have been demonstrated to consistently improve with a method based on patient-requested dose increases. Choosing a medication with adjustable dosage seems like a fair first-line therapy strategy.

Fesoterodine's adjustable dose was examined. About 50% of the 516 patients who received treatment chose to be increased. Micturition, urgency in urine expulsion, sudden urine discharge from body, and severe micturition-related urgency episodes per 24 hours all showed better results from baseline to week 12.

The study found that flexible dosage fesoterodine was well adjusted in OAB patients who are unsatisfied with previous fesoterodine and significantly reduced OAB related symptoms, HRQOL, and ratings of satisfaction. 4

MOA & Pharmacology

Fesobig is an antagonist of muscarinic receptor. By preventing attachment of ACH receptors, it decreases muscle rhythm in the bladder, allowing the bladder to store more urine and decreasing the frequency of incontinence periods.5

Fesoterodine More Affinity for M2 & M3 Receptors

The Muscarinic receptor antagonist, fesoterodine. It lowers muscle tension in the bladder, enabling the bladder to hold more pee and reducing the frequency of incontinence periods by blocking the binding of Ach to these receptors. 5

Fesoterodine is an oral prodrug that, instead of using the hepatic cytochrome pathway, is quickly forms 5- HMT, by widespread esterase, primarily in oesophagus. This molecule can also be produced from tolterodine, but only through processes that call for the CYP2D6 enzyme to be active. Fesoterodine has the benefit that it converts to 5-HMT in a way that makes the levels reasonably predictable and independent of CYP2D6 metabolizer status. Fesoterodine is rapidly and nearly completely metabolised, making it impossible to detect it in the bloodstream following oral administration. Both the bladder mucosa and the detrusor mucosa have muscarinic receptors that fesoterodine binds to. Compared to its parent chemical, 5-HMT has a muscarinic receptor affinity that is more than ten times greater. 6,7

Fesoterodine Pharmacological Properties That Make It Potentially Suitable for Older Adults

The blood-brain barrier limits the ability of fesoterodine's 5- HMT, to pass it. P-glycoprotein (P-gp) is a substrate that is actively trafficked from the CNS.

- Hepatic activation in the first pass does not occur with fesoterodine.

- The medication has a longer release.

- Its affinity for M2 and M3 receptors is balanced.

Treatment with fesoterodine was linked to the lowest percentage of patient therapy discontinuations. 8,9

FORTA Table:

Drug class	Agent	FORTA class
Antimuscarinics		
	Darifenacin	C
	Fesoterodine	B
	Oxybutynin standard dose/ immediate release	D
	Oxybutynin low dose/extended release	C
	Propiverine	D (C)*
	Solifenacin	C
	Tolterodine	C
	Trospium	C (B)*
β_3-agonist		
	Mirabegron	C

Table 3.2: Forta Table

Clinical Trial Highlighting Overall Improvement

Fesoterodine's flexible dosing: a comprehensive analysis of clinical trial data

Due to its actual dose-response impact, data from flexible-dose studies strongly support the claim that fesoterodine benefits the treatment of individual people with OAB. In clinical practise, it may be beneficial to increase the dose of fesoterodine for specific people who need the further efficacy advantage. 10

Elderly Adults with Overactive Bladder Receiving Flexible-Dose Fesoterodine (SOFIA)

The fundamentals of the study were to know whether flexible dose fesoterodine is safe for use in aged persons with OAB.

Efficacy result:

- In Fesobig, the average number of urinary urgency episodes per 24 hours dropped from 7.5 at baseline to 5.6 at week 12 compared to 8.8 to 6.3 in the placebo group.
- In Fesobig, the average amount of micturition per day dropped from 11.12 at baseline to 9.9 at week 12 compared to 12.2 to 10.9 in the placebo group.

- In Fesobig, the average number of nocturnal micturition per day dropped from 2.9 to 2.8, while it dropped from 2.9 to 2.6 in the placebo group.
- In Fesobig, the mean number of urinary urge episodes one day dropped from 3.7 to 1.1, while it dropped from 4.1 to 2.3 in the placebo group.
- In geriatrics, fesoterodine significantly improved all outcomes compared to placebo.
- In senior individuals with OAB, fesoterodine was linked with statistically significant and clinically better improvements compared to placebo. Response rates on TBS were 70% for fesoterodine with morning dose and 40% for placebo, as well as 65% for fesoterodine with evening dosing and 46% for placebo.

Safety Result:

• Constipation and dry mouth were more often reported side effects in the group of fesoterodine. When given in the morning or the evening, the incidence of these negative events was comparable. Adverse effects involving the central nervous system were infrequent.

• Catheterization was necessary for five of the six subjects who reported urinary retention. Due to this negative incident, five out of the six participants who experienced urine retention stopped participating.

Other therapies for OAB:

First line for OAB:

- Because they don't use drugs, first-line treatments for overactive bladder are often known as behavioural therapies. These include fluid management, lifestyle changes, pelvic floor physiotherapy, bladder retraining, and more.
- Medication and behavioural therapy can be used in conjunction.

Second line for OAB:

There are numerous pharmacological options available to treat OAB.

"Anticholinergic" medications and "selective beta-3 adrenergic agonists" are the two main kinds of medications that can be used to treat this condition.

Both of these drug groups are believed to work by: • Modifying aberrant nerve signals in the bladder's nerve pathways and • Relaxing the bladder muscle and assisting in the prevention of spontaneous bladder muscle contractions.

Anticholinergic medications include:

- Darifenacin
- Oxybutynin
- Solifenacin
- Tolterodine

Selective beta-3 adrenergic agonist medications:

- The first medication in this class to be made commercially available is mirabegron, which was first made available in Australia in 2014 to treat overactive bladder.

Chapter 4: RESULT

As per my understanding on the field, interaction with doctors, and from literature review, Fesobig is the best-known therapy for the patients with OAB. It is well tolerated by patient and has a better safety and efficacy profiles as compared to other therapies for OAB.

As I did field work In Hyderabad and understood that all OAB therapies are come under FORTA CLASS C it means this category is questionable as per American Urology association.

I met around 147 Urologists in Hyderabad, surprisingly they gave positive responses about Fesobig. Which drug come under FORTA CLASS B is known for beneficial for Aged Patients

Fesobig is the first launched drug in the category of OAB by MSN Laboratories., so this is new molecule for the OAB Patients in India. And that's why doctors are hesitated to prescribe new molecules.

The good news is that as I worked in Hyderabad and here doctors are prescribing Fesobig for ten days so they can try the products.

After ten days of therapy with Fesobig 8 mg taken by patients the result obtained was showing dry mouth in patients, but Fesobig 4mg shows that beneficial results in OAB patients.

Chapter 5: DISCUSSION

In most bladder-diary variables, Fesoterodine treatment was linked with statistically significantly larger improvements than placebo in elderly persons with OAB. Adults who were elderly or extremely elderly generally handled fesoterodine treatment well, with few side effects affecting the central nervous system. 11 Fesoterodine taken with additional antimuscarinic medications. Kaplan et al. assessed the addition of fesoterodine for males after a-blocker medication who had persistent storage symptoms suggestive of hyperactive bladder. The goal was to compare flexible-dose fesoterodine to a placebo in males who had OAB symptoms that persisted despite using A -blocker medication.

Fesoterodine was well-tolerated as a supplement in males with symptoms of not storing the urine. While decreases in the urge of urinary episodes at week 12 and other secondary endpoints were not substantially different therapy, the frequency of urination and symptom bother reductions were considerably greater with Fesoterodine. Antimuscarinics, with or without an a-blocker, been proven to be beneficial for treating the storage symptoms of OAB in men in a number of studies.

In the current research, the effectiveness, safe, and tolerate capacity of same dose of Fesoterodine to continuing A-blocker therapy were assessed in males with normal storage symptoms indicative of OAB who were taking stable a-blocker medication.

120 patients were randomly assigned to take therapy of Fesobig for 12 weeks in a study by Yoshihisa et al. comparing the effectiveness of these medications to silodosin for patients with benign prostatic hyperplasia complicated by overactive bladder. At week 12, changes from baseline in patients' subjective symptoms and voiding/storage functions were assessed using IPSS, OAB, OABSS, and urodynamic examinations.

In the end, 50 and 60 patients from the groups receiving mirabegron and fesoterodine, respectively, were compared. When compared to the mirabegron group, the OABSS-total significantly improved with fesoterodine.

Chapter 6: CONCLUSION

First-line pharmacological treatment for OAB is likely to continue to be antimuscarinic medication. A recently licenced medication called fesoterodine is used to treat OAB. The geriatric who live in the community and receive fesoterodine do not have an overabundance of adverse events linked to cognitive deterioration. The changing dose fesoterodine was well tolerated in geriatric OAB patients and significantly reduces symptoms of OAB, HRQL, and level of treatment satisfaction.

Chapter 7: REFERENCE:

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