Research Article

STUDY ON DRUG UTILIZATION IN GENERAL SURGERY AND ALLIED SURGERY DEPARTMENTS UNDER NATIONAL HEALTH SCHEME OF AYUSHMAN BHARATH AROGYA KARNATAKA IN TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT

Objectives: Assess drug use patterns, effectiveness, patient awareness, and adherence to the WHO Essential Drug List and NLEM under the ABARK health scheme in General Surgery and allied departments. Materials and Methods: prospective cross-sectional study was conducted in general surgery and allied surgery departments of Krishna Rajendra Hospital Mysore, Karnataka. A total of 871 cases were observed over a period of 6 months.

Results: Among 461 patients in general Surgery department the most frequently prescribed drug type is Analgesics 15.39%, 63% and 77% of drugs are prescribed from WHO EML and NLEM respectively. Electrolyte Replenisher 11.8%, analgesics 18.9%, antibiotic 35.7%, analgesics 13.8%, are most frequently prescribed drug type in Neurosurgery, Urology, Ophthalmology, ENT departments respectively. 62%, 67.40%, 32%, 59% of drugs are prescribed from WHO EML Neurosurgery, Urology, Ophthalmology, ENT departments respectively. Among 552 patients, 415 patients responded to the ABARK questionnaire where the majority of the patients were moderately aware about the ABARK scheme that is 60% and 33% of the patients were poorly aware and 7% of the patients were highly aware about the ABARK scheme. Conclusion: After comparing Drug utilization with WHO EML and NLEM. It is understood that there is scope of improving prescribing drugs from WHO EML and NLEM especially in Ophthalmology. From The responses of ABARK questionnaire. It is understood that Prior awareness about the ABARK scheme to people will help them to utilize the scheme to greater extent.

Key words: ABARK, Drug utilization pattern, General surgery, Allied surgery, WHO EML, NLEM.

INTRODUCTION

According to World Health Organization (WHO), Drug utilization research is the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequence and the pattern of use covers the extent and profiles of drug use and the trends in drug use and costs over time. The basic goal of drug utilization research is to make it easier for people to use medications rationally.[1]
Government of Karnataka introduced Arogya Karnataka on 2nd March 2018 with the objective of providing universal health coverage to all the house holders of Karnataka state. In 2018 Government of India launched Ayushman Bharath. Since both Arogya Karnataka and Ayushman Bharat scheme have same objective, both schemes were merged under a **co-**branded name "Ayushman Bharat Arogya Karnataka" scheme and is being executed in assurance mode.[2] Essential Drug List (EML) is a core list presents a list of minimum medicine needs for a basic health-care system, listing the most efficacious, safe and cost–effective medicines for priority conditions. The aim of comparing drug utilisation pattern with WHO Essential drug list is to provide high-priority pharmaceuticals to everyone at all times as part of a functioning health system, guiding physicians to evidence-based and rational prescribing.[3] As ABARK health scheme provides financial protection, a large number of patients are utilizing it. Therefore, it is significant to analyse the

awareness and effectiveness of ABARK, required improvements in the scheme and to conduct drug utilization pattern research under the ABARK health scheme. Hence it is significant to conduct drug utilization research on the rationality and effectiveness of the drugs administered under the ABARK health scheme.

MATERIALS AND METHODS

Study site: The study was conducted in General surgery and allied surgery departments of Krishna Rajendra Hospital Mysore, Karnataka. It is a tertiary care teaching hospital attached to Mysore Medical College and Research Institute Mysore, Karnataka, India.

Study Design: The study was a Prospective Cross-Sectional Study.

Study Population: We observed 871 cases in three months.

Departments Selected for The Study: General Surgery, Neurosurgery, Ophthalmology, Urology and ENT departments.

Ethical Approval: Ethical clearance was obtained from the Institutional ethical committee, Mysore Medical College and Research Institute (Ref no: CR/366/06/2021) and the same will be submitted to RGUHS University after obtaining the clearance.

Source of Data: All the relevant and necessary data were collected from Case profile of ABARK registered patients from medical record section, Patient interview, Surgery notes, Discharge summary.

Study Procedure: This Prospective Cross-Sectional Study was conducted in General surgery and allied surgery departments of Krishna Rajendra Hospital Mysore, Karnataka. A total of 871 cases were observed over a period of 3 months. Ethical approval was obtained from the Institutional ethical committee of the institute. A data collection form was suitably designed that included all the required fills and a questionnaire form which meant to evaluate awareness and knowledge of ABARK SCHEME was prepared, containing 10 multiple choice questions and the questionnaire was validated by 5 experts. An informed consent form was designed and the consent was obtained from the patients. Data was collected from case profiles of patients from General Surgery, Neurosurgery, Ophthalmology, Urology and ENT departments. Patients of both gender and all age category, who were registered under ABARK health Scheme were included. Data was collected, entered and assembled in Microsoft Excel 2010. The entered data was analysed with the help of Microsoft excel using Descriptive statistical analysis to find out the frequency and percentage of age and gender distribution, surgeries performed, drug utilization patterns and percentage of drugs prescribed from WHO and NLEM essential list. Suitable graphs, tables and charts were added.

RESULTS

Among 871 patients, 56.30% (491) were male and 43.70% (380) were female and the mean age of population was found to be 46.4 years. Out of total study population Maximum 55.22% of patients belonged to the age group 31-60 years followed by 61-90 years (23.30%) and 1-30 years (21.46%).

GENERAL SURGERY DEPARTMENT

Among the study population(n=461) in General surgery department, Hernia repair surgery 23.40% is the most performed and Ileostomy (0.2%), Colectomy (0.2%), Burr hole surgery (0.2%), Nephrectomy (0.2%), Peritonitis (0.2%), Splenectomy (0.2%), Hysterectomy (0.2%), Pericystectomy(0.2%), Rectal polypectomy (0.2%) were least performed surgeries in the department.

Table 1: Details of the Drug Prescribing Pattern of Analgesics in General Surgery Department.

Drug type	Count of drug type	Percentage
ANALGESIC	1231	15.39%
ELECTROLYTE REPLENISHER	975	12.19%
ANTIBIOTIC	923	11.54%
VITAMIN SUPPLEMENT	640	8.00%
GASTROINTESTINAL DRUG	637	7.96%
LOCAL ANAESTHETIC	542	6.78%
ANXIOLYTIC	455	5.69%
ANTIEMETIC	399	4.99%
VACCINE	314	3.93%
GENERAL ANAESTHETIC	216	2.70%
LAXATIVES	168	2.10%
ANTIINFLAMMATORY DRUGS	155	1.94%
IRON SUPPLEMENT	139	1.74%
SKELETAL MUSCLE RELAXANT	135	1.69%
ACH INHIBITOR	133	1.66%
ANTIDIABETIC	132	1.65%

BRONCHODILATOR	119	1.49%
ANTIHYPERTENSIVE	114	1.42%
PROTIEN POWDER	70	0.88%
CHOLINERGICS	69	0.86%
ANAESTHESIA REVERSAL	69	0.86%
COAGULANT	53	0.66%
DRUGS FOR POST OPERATIVE WOUND HEALING	50	0.63%
DRUGS USED FOR ANAL FISSURE TREATMENT	35	0.44%
ANTIHELMINTIC	26	0.32%
CALCIUM SUPPLEMENT	23	0.29%
THYROID HORMONE	22	0.28%
HEPATOPROTECTIVE	18	0.23%
ANTIPLATELET	12	0.15%
ANTIHISTAMINE	11	0.14%
COUGH AND COLD SUPPRRESANTS	11	0.14%
STATINS	9	0.11%
ANTINEOPLASTIC DRUGS	8	0.10%
POTASSIUM SUPPLEMENT	8	0.10%
URINARY ALKALIZER	7	0.09%
ANTICONVULSANT	7	0.09%
VASODILATOR	5	0.06%
ANTISPASMODIC	5	0.06%
ANTIFUNGAL	5	0.06%
PROBIOTICS	5	0.06%
DRUGS FOR BPH	4	0.05%
ANTICOAGULANT	4	0.05%
ANTIDEPRESSANT	4	0.05%
ANTIVIRALS	4	0.05%
ANTIEPILEPTIC	4	0.05%
MISCELLANEOUS TOPICAL	4	0.05%
DIGESTIVE ENZYME	3	0.04%
MAGNESIUM SULFATE	3	0.04%
ANTIANGINAL	3	0.04%
ANTIPARKINSON DRUGS	3	0.04%
SEDATIVE	2	0.03%
ANTICHOLINERGIC	2	0.03%
MUCOLYTIC	1	0.01%
DECONGESTANT	1	0.01%
ANTIDIARRHEAL	1	0.01%

In general surgery department the most frequently prescribed drug type is Analgesics, in analgesics the most prescribed drugs are Paracetamol 28.30% (n=348) followed by Diclofenac 23.50% (n=289) and the least prescribed are Etoricoxib + Paracetamol 0.1% (n=1), Thiocolchicoside + Aceclofenac 0.1% (n=1), Drotaverine + Aceclofenac.

In electrolyte Replenisher, the most frequently prescribed one is Ringer Lactate 34.60%(n=337) least prescribed Electrolyte Replenishers are 25% Dextrose injection 1(0.1%), Oral Rehydration salt 1(0.1%).

In antibiotics, the most frequently prescribed class are 3rd Generation Cephalosporin 41.70%(n=385) In 3rd generation cephalosporin(n=385) Ceftriaxone was the most prescribed drug 93.8% (n=361). The least prescribed antibiotic was class tetracycline 0.1%(n=1), Fluroquinolones + β lactamase inhibitor 0.1%(n=1).

In vitamin supplement(n=640), the most frequently prescribed vitamin supplements are vitamin B complex 48.90(n=313). The least prescribed are, folic acid + cyanocobalamine + nicotinamide, Vitamin D.

In gastrointestinal drugs(n=637), the most frequently drug class are PPI 68.90%(n=439). In PPI(n=439) Pantoprazole 96.4%(n=425) is the most prescribed drug and the least prescribed class was dopamine receptor antagonist + PPI 1.25%(n=8).

In Anaesthetics(n=758), the most frequently prescribed anaesthetics was Local anaesthetics 71.50%(n=542) followed by general anaesthetics 28.50%(n-216). In local anaesthetics the most commonly prescribed Local anaesthetic was Lidocaine(n=322) and in general anaesthetic the most prescribed anaesthetic was propofol(n=111).

NEUROSURGERY DEPARTMENT

Among study population (n=20) in neurosurgery department, Laminectomy + discectomy 30% was most performed surgery in this department. Meningocele repair with detethering of cord 5%, laminectomy 5% least performed surgeries in the department.

DRUG UTILIZATION PATTERN

Table 2: Details of the Drug Prescribing Pattern in Neurosurgery Department.

Drug type (n=372)	**Count of drug type**	**Percentage**
ELECTROLYTE REPLENISHER	44	11.8%
ANXIOLYTIC	38	10.2%
ANALGESICS	37	9.9%
GENERAL ANAESTHETIC	23	6.2%

GASTROINSTESTINAL DRUG	21	5.6%
ANTIBIOTIC	21	5.6%
ACH INHIBITOR	19	5.1%
LOCAL ANAESTHETIC	19	5.1%
VACCINE	19	5.1%
ANALGESIC+SKELETAL MUSCLE RELAXANT	18	4.8%
ANTIINFLAMMATYORY DRUGS	18	4.8%
SKELETAL MUSCLE RELAXANT	17	4.6%
ANTIDEPRESSANT+ANTI CONVULSANT	17	4.6%
ANTIEMETIC	16	4.3%
CHOLINERGICS	10	2.7%
ANTIDEPRESSANT+ANXI OLYTIC	7	1.9%
ANAESTHESIA REVERSAL	6	1.6%
BRONCHIODILATOR	5	1.3%
ANTICONVULSANT	4	1.1%
ANTIDIABETIC	3	0.8%
ANTIHYPERTENSIVE	3	0.8%
LAXATIVE	1	0.3%
DRUGS FOR NEUROPATHIC PAIN	1	0.3%
ANTICOAGULANT	1	0.3%
THYROID HORMONE	1	0.3%
LTRAS	1	0.3%
ANTIHISTAMINE	1	0.3%
LIPID LOWERING DRUG	1	0.3%

In electrolyte replenisher, the most frequently prescribed one is Ringer Lactate 34%(n=15) and Normal saline 34%(n=15) and least prescribed electrolyte replenishers are 32% Dextrose Normal saline.

UROLOGY DEPARTMENT

Among study population (n=41) in Urology department, TURP 27% was most performed surgery in this department. Pyelolithotomy 2%(n=1), URS 25%(n=1), Ureterolithotomy2%(n=1), Incision and drainage 2%(n=1), Varicocelectomy2%(n=1), Nephrostomy 2%(n=1), Nephrectomy 2%(n=1), Penectomy+Urethrostomy 2%(n=1) were least performed surgeries in the department.

Table 3: Details of the Drug Prescribing Urology Department.

Drug type	Count of drug type	Percentage
ANALGESIC	106	18.9%
ANTIBIOTIC	73	13.0%
ELECTROLYTE REPLENISHER	68	12.1%
LOCAL ANAESTHETIC	63	11.2%
GASTROINTESTINAL DRUGS	60	10.7%
ANXIOLYTIC	39	7.0%
ANTIEMETIC	33	5.9%
VACCINE	30	5.3%
VITAMIN SUPPLEMENT	16	2.9%
GENERAL ANAESTHETIC	12	2.1%
ANTIDIABETIC	11	2.0%
SKELETAL MUSCLE RELAXANT	7	1.2%
BRONCHIODIALATOR	7	1.2%
ANTIINFLAMMATORY	6	1.1%
ACHINHIBITOR	6	1.1%
ANTIHYPERTENSIVE	4	0.7%
CHOLINERGIC	4	0.7%
DRUGS FOR PAIN AND SWELLING REDUCTION	3	0.5%
THYROID HORMONE	2	0.4%
URINARY ALKALIZER	2	0.4%
ANAESTHESIA REVERSAL	2	0.4%
LAXATIVE	2	0.4%
ANTIHYPOTENSIVE DRUG	1	0.2%
ANTIHELMINTIC	1	0.2%
DRUGS FOR BLEEDING PREVENTION	1	0.2%
ANTISPASMODIC	1	0.2%
DRUGS FOR BPH	1	0.2%

In analgesics the most prescribed drugs are Tramadol 30.20% (n=32), followed by Buprenorphine 25.50% (n=11) and the least prescribed are Mefenamic acid 0.90%(n=1).

OPTHALMOLOGY DEPARTMENT

SICS WITH PCIOL surgery is the most performed surgery in this department 64.4% and Excision Biopsy 0.9%, DCR 0.9%, SICS With Planned

Aphakia 0.5%, Central Tear Repair 0.5% were least performed surgeries in the department.

Table 4: Details of the Drug Prescribing Pattern in Ophthalmology Department.

Drug type(n=1124)	Count of drug type	Percentage
ANTIBIOTIC	401	35.7%
ANALGESIC	304	27.0%
ANTIBIOTIC + ANTIINFLAMMATORY	201	17.9%
GASTRO INSTESTINAL DRUG	160	14.2%
ANTIINFLAMMATORY DRUGS	14	1.2%
ANTIHYPERTENSIVE	10	0.9%
MISCELLANEOUS TOPICAL	4	0.4%
ANTIDIABETIC	4	0.4%
ANXIOLYTIC	4	0.4%
ANTIALLERGIC	3	0.3%
LOCAL ANAESTHETIC	2	0.2%
DRUGS FOR INTRAOCULAR PRESSURE TREATMENT	2	0.2%
VITAMIN SUPPLIMENT	2	0.2%
ANTIFUNGAL	2	0.2%
ACH INHIBITOR	2	0.2%
ANTIASTHMATIC	2	0.2%
DRUGS FOR GLAUCOMA TREATMENT	1	0.1%
DRUGS FOR OPTIC NEURITIS PREVENTION	1	0.1%
STATIN	1	0.1%
IRON SUPPLIMENT	1	0.1%
ELECTROLYTE REPLENISHER	1	0.1%
CALCIUM SUPPLIMENT	1	0.1%
ANTIMETABOLITE	1	0.1%

In antibiotics, the most frequently prescribed class are Fluoroquinolones 57.1%(n=229) followed by Chloramphenicol Antibiotic 32.7% (n=131). In Fluoroquinolones (n=229), ciprofloxacin was the most prescribed drug 168(73.4%). The least prescribed class was Nitroimidazole 0.2% (1), Carbapenem Antibiotic 0.2% (1).

ENT DEPARTMENT

Details of the surgery performed for study population in ENT department are given in following Table Adenotonsillectomy was the most performed surgery in this department 17% and Myringoplasty(1%), Incision and drainage(1%), Local excision(1%), Conservative management(1%) were least performed surgeries in the department.

Table 5: Details of the Drug Prescribing Pattern in ENT Department.

Drug type(n=1852)	Count of drug type	Percentage
ANALGESIC	256	13.8%
ANXIOLYTIC	206	11.1%
GENERAL ANAESTHETIC	192	10.4%
ANTIBIOTIC	178	9.6%
GASTRO INSTESTINAL DRUG	130	7.0%
LOCAL ANAESTHETIC	119	6.4%
VACCINE	117	6.3%
SKELETAL MUSCLE RELAXANT	98	5.3%
ANTIHISTAMINE	96	5.2%
ANTIINFLAMMATORY DRUGS	96	5.2%
ACH INHIBITOR	94	5.1%
ANTIEMETIC	85	4.6%
CHOLINERGICS	57	3.1%
ANAESTHESIA REVERSAL	39	2.1%
ELECTROLYTE REPLENISHER	27	1.5%
VITAMIN SUPPLEMENT	22	1.2%
BRONCHIODIALATOR	12	0.6%
ANTIHYPERTENSIVE	7	0.4%
DECONGESTANT	5	0.3%
DRUGS FOR POST OPERATIVE WOUND HEALING	4	0.2%
ANTIPSYCHOTIC	2	0.1%

In analgesics the most prescribed drugs are Diclofenac 41.0%(n=105) followed by Fentanyl 23.8%(n=61) and the least prescribed are Diclofenac + Serratiopeptidase 0.4%(n=1), Mefenamic Acid + Paracetamol 0.4%(n=1).

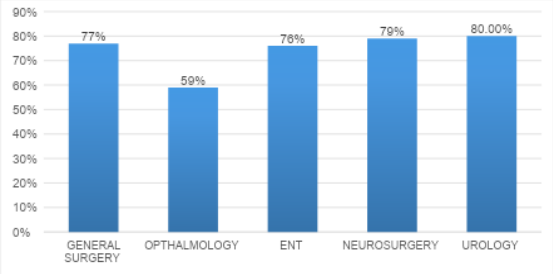

Figure 1: Percentage Wise Distribution of Drugs Prescribed for Study Subjects in Allied Surgery Departments in WHO EML.

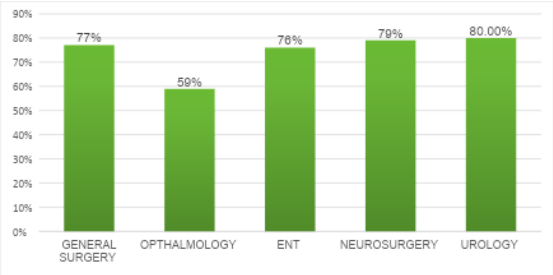

Figure 2: Percentage Wise Distribution of Drugs Prescribed for Study Subjects in Allied Surgery Departments in NLEM.

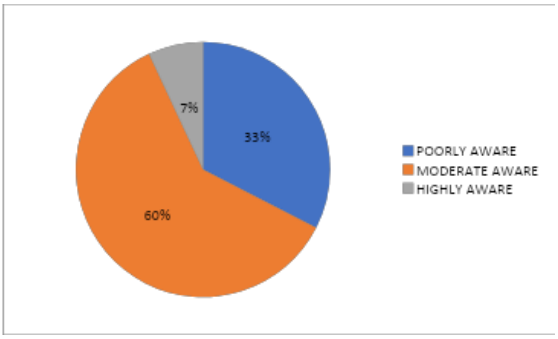

Figure 3: Representation of Results of Awareness Based Questionnaires.

RESULTS OF KNOWLEDGE BASED QUESTIONNAIRES

Here 66% patients got the awareness from the healthcare workers 19% of the patients got awareness from the other patients, 10% of the patients got the awareness from family/friends and 6% of the patients got awareness from the advertisements.

46% of the patients claim got approved within 1 week, 36% of the patients claim got approved within 3 days, 11% of the patients got the claim to approved on admission, it took more than a week for 6% of the patients for the claim to be approved.

36% of the patients were not much benefited by the scheme due to availability of required laboratory services outside the hospital, 46% of the patients were not benefited due to availability of the required drugs outside the hospital, 11% of the patients were not benefited due to delay in registration, 6% of the patients were not benefited due to other reasons.

DISCUSSION

In general surgery department the most prescribed class was analgesics and In analgesics the most prescribed drug was Paracetamol and Ringer lactate was the most prescribed electrolyte Replenisher, But In a study conducted by Khyati M Patel, Shilpa D Jadav et al.., Tramadol was most prescribed analgesic, Paracetamol had lower value than our study and Dextrose normal saline is most prescribed electrolyte Replenisher.[4] In our study Antibiotics was the third most prescribed drug in our general surgery department. In antibiotics, the most frequently prescribed class are third Generation Cephalosporin and in third generation cephalosporin Ceftriaxone was the most prescribed. Whereas Ciprofloxacin antibiotics was most prescribed in Khade, MSM Bashir et al.., study.[5] In General Surgery department 63% and 77% of drugs are prescribed from WHO EML and NLEM respectively. In N.B Bhansali, T.R Gosai study 45.71% of drugs was prescribed from NLEM Which is lower than our study.[6] In Salman M T, Akram MF et al.., study 61.4% of drugs are prescribed from WHO EML, which is lower than our study.[7] In Neurosurgery department Electrolyte Replenisher are most commonly prescribed followed by Anxiolytics and in general anaesthetics the propofol was commonly used general anaesthetics. Whereas thiopentone + propofol combination general anaesthetic was administered most in a study conducted by Dr Rejanigandha, Dr Resmi Douglas et al..,.[8]

In urology department the most frequently prescribed drug type is analgesics followed by antibiotic. In our study Ceftriaxone was the most prescribed 3rd generation cephalosporin antibiotic which differs from R Uppal et al.., study where gentamycin was the most used antibiotic in urology department.[9]

Antibiotics takes fourth place in drug prescribing pattern list in ENT Department. In Antibiotics third generation cephalosporin was most prescribed class and in third generation cefotaxime was most prescribed. In Dr. Deependra Prasad sarraf, Bajarang Prasad Sah study ceftriaxone was the most prescribed antibiotic drug.[10]

In ophthalmology department the most frequently prescribed drug type is antibiotic. which is similar to Pooja Prajwal, Mohandas Rai et al.., study.[11]

The responses for ABARK questionnaire say that more than half of the patients are moderately aware of the scheme and most of the patient's got awareness about ABARK scheme from healthcare workers. Nearly half of the patients claim got approval by 1 week and 46% of patients were not

benefitted by ABARK scheme due to availability of drugs outside the hospital.

CONCLUSION

As ABARK scheme is utilised by large number of people this study focuses on drug utilisation pattern under ABARK health scheme, ABARK scheme awareness and effectiveness in surgery and allied surgery department. it also focuses on utilisation of drugs from WHO EML and NLEM.

Analgesic is most prescribed in ENT, General surgery, Urology, in Ophthalmology antibiotic was prescribed and electrolyte replenisher was most prescribed in neurosurgery.

After comparing drug utilisation with WHO EML and NLEM. It is understood that there is scope of improving prescribing drugs from WHO EML AND NLEM especially in Ophthalmology.

From The responses of ABARK questionnaire which was asked to study population, it is understood that more than half of the patients are moderately aware of the scheme and only few were highly aware of the scheme and nearly half of the patients claims got approval by 1 week. So Prior awareness about the ABARK scheme to people will help them to utilise the scheme to greater extent and awareness should be given to people in all the possible ways for maximum utilisation scheme.

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