Concept of Essential Drugs

Dr Shinde Viraj Ashok

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Dep of Pharmacology

Overview

- Definition
- Criteria for selection essential medicines
- Guidelines for establishing national programme of essential medicines
- Advantages and disadvantages of essential medicines list
- Summary of 18th essential medicine list & 4th essential medicine list for children 2013
- Salient features & evaluation of national list of essential medicines 2011
- Conclusion

"The desire to take medicines is one feature which distinguishes man, the animal from his fellow creatures. It is one of the most serious difficulties with which we have to contend."

William Osler 1891

Definition

- The concept of essential medicines

A limited range of carefully selected essential medicines leads to better health care, better drug management and lower costs.

- Definition of essential medicines

Essential medicines are those that satisfy the priority health care needs of the majority of population.

They should be available at all times, in adequate amounts, in appropriate dosage forms and at affordable price.

History of the WHO Model List of Essential medicines

- 1977 First Model list published, ± 200 active substances.
- List is revised every two years by WHO Expert Committee.
- 18th WHO model EML published in April 2013, is proof that the concept is still valid after nearly 36 years and continues to have many advantages when it is used appropriately and in conjunction with standard treatment guidelines.

Criteria for selection of essential medicines

WHO list of essentail medicines - Model or "guiding list"

1. Quality of drugs – Only those drugs should be selected for which sound & adequate data on safety & efficacy are available.
2. Pattern of prevalent disease – Most effective drug against locally prevalent disease is selected.

Criteria …

3. Cost – Major consideration in drug selection

Cost of total treatment & not just one unit must be considered.

Criteria ...

4. Benefit risk ratio-

When several comparable drugs are available for same therapeutic indication – Drug which provides most favourable benefit / risk ratio is to be selected.

When two or more drugs are therapeutically equivalent preference should be given to -

a. Better understood drug.
b. Clinical utility – Treatment of more than one condition or disease.
c. Favourable pharmacokinetic profile preferred.
d. Favourable stability under local anticipated conditions.
e. Local reliable manufacturing facilities exist.

Criteria …

6. Dosage forms –

Selection of dosage forms –

- On the basis of general utility & wider availability
- Restricts number of preparations to minimum.

7. Financial resources – 20% of total expenditure on health is spent on drugs.

Criteria ...

8. Genetic, Demographic & Environmental factors.
9. Mortality and morbidity statistics.
10. Local manufacture and storage facilities.
11. Selection of essential medicines should be a continuous process.
12. Essential medicines should be based on rationally developed treatment guidelines.

Guidelines for establishing a national programme for essential medicines

- Standing committee of health care professionals (competent individuals in fields of medicine, pharmacology, peripheral health workers) –

  for technical advice .
- International non proprietary (generic) names for drugs or pharmaceutical substances should be used whenever available –

  Prescribers should be provided – Cross index of non-proprietary and proprietary names

Guidelines …

- Concise, accurate & comprehensive drug information prepared – To serve as a pocket guide rational drug use.
- Quality (drug content, stability & bioavailability) –

1. Assured through testing
2. Suppliers should provide documentation of product's compliance with required specification

Guidelines …

- Success of essential medicines programme depends on –

1. Efficient administration of supply
2. Storage
3. Distribution from manufacturer to end user

- Procurement policy – Based up on detailed records of turnover.
- Local level of expertise – To prescribe administer & monitor safety of drugs.

Selection of Antimicrobial agents

- Sensitivity of micro-organisms.
- Prevalence of type of infection.
- Resistance to Anti microbial agents. (AMA)
- Availability of AMA (Safe, Effective, Affordable)
- Cost of the drugs.

Periodic updating

- Must be reviewed yearly or whenever necessary.
- Must be flexible to accommodate new drugs, new information on established drugs.

Counterfeit drugs

- WHO has established a database for reports on counterfeit drugs & developed methodologies for determination of prevalence of both counterfeit and substandard products.

Advantages of essential medicine list

- More cost effective drug control, management, purchase, storage and distribution.
- Improved drug use in terms of safety, simplified and more efficient drug information including training to health worker.
- Identification & avoidance of adverse drug reaction and interaction.
- Stimulation of local drug formulation and production.

Disadvantages of essential medicine list

- Reduced freedom of choice.
- Creation of monopolies – Favouring a single drug product.
- Reduced possibilities for gaining episodic experience e.g. new application of old drug.
- Lack of interest for drug innovation.

What is core list ?? & complementary list ??

- Core list – List of minimum medicine needs for a basic health care system, listing the most efficacious , safe and cost effective medicines for priority conditions.
- Complementary list – Essential medicines for priority diseases , for which specialised diagnostic or monitoring facilities and or specialist medical care and or specialist training are needed.

Summary of recommendations 18th WHO EML 2013

Additions to 18th WHO Model List of Essential Medicines 2013

Section 2.

- Amitriptyline, Diazepam,
- Dexamethasone, Docusate sodium,
- Haloperidol, Loperamide,
- Hyoscine butylbromide, Ibuprofen,
- Metoclopramide and Morphine

were added to the core list.

Additions to 18th WHO Model List of Essential Medicines 2013

- **Section 3.** Loratadine - superior safety when compared with first-generation antihistamines.
- **Section 4.** Fomepizole (complementary list) - Treatment of toxic alcohol and glycol poisoning.
- **Section 6.4.3.** Pegylated interferon alfa-2a and alfa-2b (complementary list) - Treatment of hepatitis C.

Additions to 18th WHO Model List of Essential Medicines 2013

- **Section 6.5.3.1.** Artesunate + mefloquine - 25 + 55 mg and 100 + 220 mg (as fixed dose combinations)(Corelist) - Treatment of uncomplicated Falciparum malaria.
- **Section 11.1.** Fresh-frozen plasma, platelets, red blood cells and whole blood - Core list

Additions to 18th WHO Model List of Essential Medicines 2013

- **Section 18.5.** *Gliclazide* (30 mg, 60 mg, 80 mg) replaced glibenclamide in the core list with a square box symbol to indicate it as the example of a second-generation sulfonylurea.

Additions to 18th WHO Model List of Essential Medicines 2013

Section 21..

1. Azithromycin 1.5% eye drops (core list)- Treatment of trachoma in pregnant women and children under one year of age.
2. Bevacizumab (complementary list) - Intravitreal injection for neovascular age-related macular degeneration.
3. Latanoprost eye drops (50 µg/ml) (core list) - Treatment of open-angle glaucoma.
4. Ofloxacin 0.3% eye drops (core list) - Treatment of bacterial keratitis .

Additions to 18th WHO Model List of Essential Medicines 2013

- **Section 24.1.**

Risperidone (core list) - Treatment of schizophrenia.

- **Section 24.1.**

Clozapine(complementary list)- Treatment of patients with schizophrenia refractory to other treatments.

Additions to 18th WHO Model List of Essential Medicines 2013

- **Section 27.** Calcium tablets (500 mg of elemental calcium) (core list)for pregnant women in areas where dietary calcium intake is low and for women at high risk of developing hypertensive disorders during pregnancy.

Deletions from 18th WHO Model List of Essential Medicines 2013

- **Section 3.** Chlorpheniramine was deleted because of inferior safety when compared with second-generation antihistamines and loratadine, a second-generation antihistamine, was substituted.
- **Section 13.4.** Dithranol (for topical treatment of psoriasis) was deleted because of concerns about the balance between benefits and risks and the low utilization

Summary of 4th Essential Medicines List for Children (EML_C) 2013

Additions to 4th EMLc 2013

- **Section 2.** Morphine granules and slow-release tablets - core list.
- **Section 3.** Loratadine solid oral dosage form (10 mg) and oral liquid (1 mg/ml) (core list) - Superior safety when compared with first generation antihistamines.

Additions to 4th EMLc 2013

- **Section 4.** Fomepizole (complementary list)- Treatment of toxic alcohol and glycol poisoning.
- **Section 6.2.4.** Ofloxacin was replaced by levofloxacin in the complementary list with an asterisk to indicate that ofloxacin and moxifloxacin may be used as alternatives. Ethionamide had an asterisk to indicate that protionamide may be used as an alternative.

Additions to 4th EMLc 2013

- **Section 6.5.3.1.** Artesunate + mefloquine - 25 + 55 mg and 100 + 220 mg (as a fixed dose combination) (core list) - Treatment of uncomplicated falciparum malaria.
- **Section 6.5.5.1.** Nifurtimox tablets 120 mg (core list) to be used in combination with eflornithine- Treatment of Trypanosoma brucei gambiense infection.

Additions to 4th EMLc 2013

- **Section 6.5.5.2.** Benznidazole 12.5 mg and 50 mg scored solid oral dosage forms (core list) - Treatment of infections of Trypanosoma cruzi.
- **Section 11.1.** Fresh-frozen plasma, platelets, red blood cells and whole blood - core list.

Additions to 4th EMLc 2013

- **Section 11.3.** Dextran 70 (core list) - volume replacement when safer alternatives are not available.
- **Section 29.1.** Chlorhexidine 7.1% solution or gel delivering 4% (core list) - Umbilical cord care in community settings.

Deletion from 4th EMLc 2013

- **Section 3.** Chlorpheniramine - Deleted - Inferior safety when compared with second-generation antihistamines.

Are all the drugs not figuring in essential drugs list useless or redundant?

- List of essential drugs does not imply that no drugs outside it are useful.
- These drugs may be more expensive alternatives or useful only for uncommon ailments.
- May be harmful or hazardous.
- May be irrational fixed dose combination.

- 134 countries in the world have their own EMLs.
- The Government of India, prepared and published its first National Essential Drugs List in 1996.
- Revised in 2003 as the National List of Essential Medicines.
- The National List of Essential Medicines of India (NLEMI 2011) was revised recently by the Ministry of Health and Family Welfare (MOHandFW), Government of India (GOI), in June 2011, nearly eight years after the previous list, on the directions of the Supreme Court of India.

Salient features of NLEM 2011

- Medicines have been categorised according to therapeutic area.
- Issue of mentioning the strength of the medicine dose was deliberated.
- For essentiality of requirement the medicines have been categorised as follows:-

P, S and T denote essentiality at Primary, Secondary and Tertiary levels respectively while P, S, T (U in NLEM 2003) indicates essentiality at all the levels.

- A total of 348 medicines (excluding repetitions) & 12 fixed dose combinations are present in NLEM 2011

- In the NLEM 2011, 181 medicines fall under the category of P, S and T, 106 medicines fall under the category of S, T while 61 medicines are categorized as T only.
- In comparison to NLEM 2003, number of medicines deleted is 47 and 43 medicines have been added.

Evaluation of national list of essential medicines

Strengths

- NLEMI was revised after eight years of much delay.
- Process of revising the NLEMI was clearly transcribed in the executive summary as well as in a separate section of the document.

Strengths

- NLEMI gives the names of all the additions and deletions as well as detailed lists of medicines in alphabetical order, classified therapeutic area and category-wise.
- Experts from nearly all specialties were included in the expert group for the preparation of the list.

Strengths

- Executive summary, salient features of the NLEMI and the potential uses of the list have been well written, in simple language, to permit health care professionals, students and even others like health activists and media persons to understand what an essential medicines list is all about.

Major weakness

Improper selection of medicines

- The very first medicine to be listed in the NLEM India 2011 is 'ether' as a general anesthetic, meant to be used in secondary and tertiary facilities.
- WHO EML and EMLc have included hydroxocobalamin, whereas NLEMI has cyanocobalamin in the list.

Major weakness

- Pyridoxine tablets (10 mg) have been included in the NLEMI under antianemic medicines.

Pyridoxine is indicated for idiopathic sideroblastic anemia.

Major weakness

- Under ophthalmological preparations (section 21) six anti infective agents have been listed but acyclovir, an antiviral agent has been left out.

Incidentally the WHO Model EML 2011 lists just three, including acyclovir in this section.

- Eight radiocontrast media have been listed in the NLEMI with all of them categorized for secondary and tertiary centers.

Only three are listed in the WHO EML with another one under the complementary list.

Major weakness

Improper principles of medicine selection

Medicines have been included not taking into account the principles of selection of essential medicines.

- Pantoprazole and famotidine have been added when omeprazole and ranitidine are already on the list.
- Oxaliplatin has been added when cisplatin is already in the list.

Major weakness

- Including medicines of the same class which have no major advantages in efficacy and safety is against the principles of selection.
- The section on antiallergics and medicines used in anaphylaxis lists pheniramine, chlorpheniramine and dexchlorpheniramine, all three with a similar pharmacological profile. Cetirizine has also been added.
- Prednisolone acetate and prednisolone sodium phosphate (ophthalmological agents) both are used for the same indications and neither has any advantage over the other.

Major weakness

- Medicines for tuberculosis are recommended to be administered as fixed dose combinations (FDCs) in the revised national TB control program (RNTCP), by the WHO.
- None of the FDCs have been included in the NLEMI.
- WHO Model EML includes five FDCs of antituberculosis medicines.
- List fails to provide harmonization in terms of listing the medicines in the national health programs.

Major weakness

- Lack of uniformity in expressing strengths of medicines .
- The WHO Model lists follows convention, for drugs which are available as solution for injection, the standard convention is to express the strength as 'per ml'.
- NLEMI 2011 follows multiple formats for expressing the strength of injectable, viz - 'per ml', 'per 2 ml' (e.g. amikacin), 'per 5 ml' (e.g. 5-fluorouracil, paclitaxel, sodium nitroprusside).

Major weakness

- Adding to the confusion, for some drugs (e.g. cisplatin, cytosine arabinoside) it is expressed as 'per vial'.
- Liquid oral dosage forms, the strength is expressed in two different ways - 'per 5 ml' and 'per ml'.
- Even though these inconsistencies look trivial, they are dangerous as it can lead to errors in dose of drugs prescribed which may cause treatment failure or toxicity.

Major weakness

- NLEMI 2011 includes premix insulin (30: 70) injection, but it is not specified which of the two insulin preparations are mixed in this.
- **Non-inclusion of pediatric formulations**
  Many drugs have formulations to suit different adult doses.

For example, fluconazole tablets are available in four different strengths (50 mg, 100 mg, 150 mg and 200 mg) for adults in the list.

- No dose / dosage form for children.

Major weakness

Major limitation of NLEM 2003 which has not been addressed in this list is

Many drug groups –

1. Benzodiazepines (diazepam, midazolam)
2. Opioids (morphine)
3. Antibiotics (doxycycline, metronidazole)
4. Antifungals (fluconazole, griseofulvin, nystatin)
5. Antiretrovirals (lamivudine, stavudine, zidovudine, efavirenz)

Do not have dose or dosage form appropriate for children.

Conclusion

- The concept of essential medicines is a global concept.
- WHO clinical guidelines are the foundation for the Model List of Essential Drugs; the Model List remains a strong public health tool.
- The WHO Essential Medicines Library is a valuable information base for all Member States, international organisations, drugs and therapeutic committees and health insurance organisations.
- Essential medicine concept is not a short cut to escape from therapeutic jungle, but to choose use, store, the right kind of hidden treasure in it.

Take Home Message ....

- E - Efficacy
- S - Safety and suitability
- S - Storage and stability
- E - Ease of administration (dosage form)
- N - Need of population
- T - Total cost
- I - Irrational combination to be avoided
- A- Availability, Affordability
- L - Listing regularly (updating)

References

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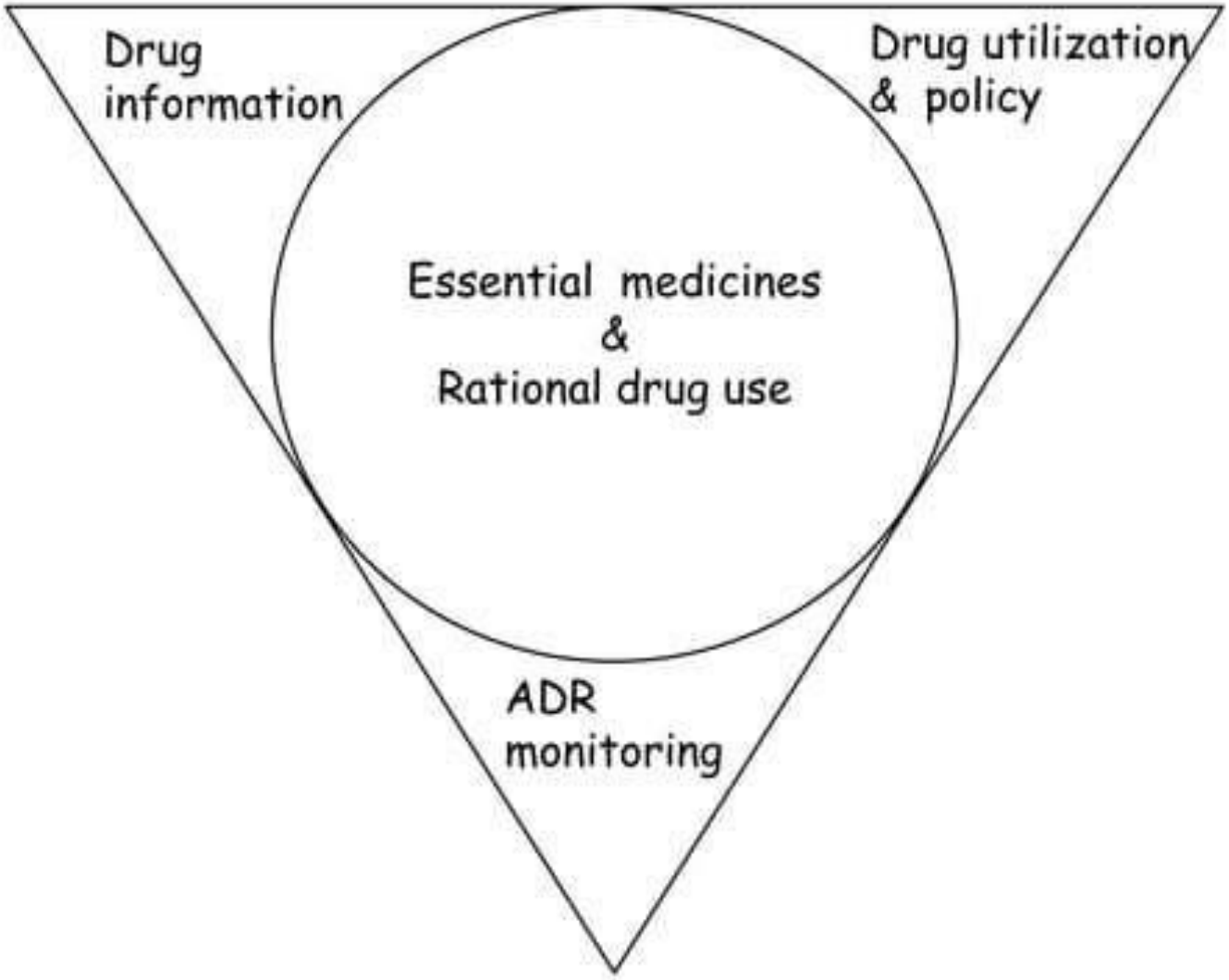
Thank you!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