GMP and Quality Assurance

B Pharm VI Sem (BP 606 T)

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Contents

- According to FDA a drug is defined as adulterated if the methods used in its manufacture or processing Testing

Packaging Storing

Did not conform to the GMPs

As a result of this, GMPs were first established in June 1963 The concept was born in U.S.A

- Drugs being a very important component of health care system need special attention in regard to their
- Quality
- Safety
- efficacy

- Final testing of the product cannot ensure the quality, safety, efficacy of a product
- Therefore the concept of QC evolved
- The development of QC resulted in GMPs

- Many Indian drug manufacturers export pharmaceutical preparations to other member countries of WHO
- Indian drug manufacturers as well as their technical personnel should be aware of the GMP guidelines prepared by WHO
- These are referred to WHO GMPs

What is GMP ?

- GMP is that part of Quality assurance which ensures that the products are consistently manufactured and controlled to the Quality standards appropriate to their intended use

- "GMP" - A set of principles and procedures which, when followed by manufacturers for therapeutic goods, helps ensure that the products manufactured will have the required quality.

- The Govt of India amended the drugs & cosmetics rules, 1945 on 24th june 1988 and prescribed GMPs under Schedule M
- Schedule M has 2 parts, part 1 and part 2
- GMP guidelines come under part1
- The Schedule M has been revised and brought more less to the level of WHO GMP text

WHO GMP ensures the following:

- Avoidance of Cross- Contamination
- Prevention of Mix-ups
- Provide Traceability
- Accountability of actions
- Responsibility
- Product Performance Guarantee

- India is the world’s second largest producer of APIs, not only in quantity but also in the variety of molecules.
- Indian API manufacturers have traditionally complied with US GMP regulations since the majority of the material produced is for export.

- The current trend in pharmaceutical companies in India is that they adopt ICH structured guidelines, GMP regulations, audit topics and legal requirements as per target country and gear up for the audit.

- But necessarily the manufacturer may not follow Schedule M for facing international audits. The difference between the GMP standards of the drug supplying countries and the receiving countries may therefore result in ambiguities and difficulties relating to its compliance.

Objectives of GMP

- To produce products conforming to the pre-determined specifications
- To produce products of consistent quality
- To minimize contamination
- To eliminate errors

Good Manufacturing Practices

- A basic tenet of GMP is that quality cannot be tested into a batch of product but must be built into each batch of product during all stages of the manufacturing process.

- It is designed to minimize the risks involved in any pharmaceutical production that cannot be eliminated through testing the final product.

Aim of GMP

- diminishing the risks inherent in pharmaceutical production, which may broadly be categorized into
  1. unexpected contamination of products
  2. incorrect labels on containers
  3. insufficient or too much active ingredient

- Above all, manufacturers must not place patients at risk due to inadequate safety, quality or efficacy; for this reason, risk assessment has come to play an important role in WHO quality assurance guidelines.

Quality assurance

- Quality assurance is a much wider concept
- Covers all matters which individually or collectively influence the quality of a product

QA= GCPs + GMPs + GLPs


Safety in handling and use
Supplied innovation
Effect in customer application
Quality
Product uniformity
Assurance of delivery
Environ-mental acceptability
Customer service
Product stability

- QA

Quality Assurance is the sum total of the organised procedures ensuring that products will be fit for their intended use.

- GMP

GMP is the part of QA that ensures products are consistently manufactured to a standard appropriate to their intended use. It is concerned with both manufacturing and Quality Control procedures.

- QC

Quality Control is the part of GMP which is concerned with sampling, specification and testing and also organization, documentation and release.

WHO GUIDELINES

The revised text contains 3 parts.

- Part I: out lines the general concepts of quality assurance and salient components of GMP's.
- Part II: outlines on actions to be taken by production & qc personnel separately for implementing general principles of quality assurance.
- Part III: supporting and supplementary guidelines.

ANNEX I: Quality Management in the Drug Industry -Philosophy & Essential Elements

- Quality Assurance
- Good Manufacturing Practice Quality
- Control
- Sanitation & Hygiene
- Validation
- Complaints
- Product recalls
- Contract Production & Analysis
- Personnel
- Premises
- Material
- Documentation

ANNEX II: Good Practices – Production & Quality Control

- Good Practices in Production
- Good Practices in Quality Control

ANNEX III: Supporting and Supplementary Guidelines

- Sterile pharmaceutical Products
- Good Manufacturing Practice for *Active Pharmaceutical Ingredients*

What is done under GMP can be summarized as follows

1. all processes are clearly defined systematically
2. All necessary resources are provided by
   - Adequately qualified and trained personnel
   - Adequate premises and equipment
   - Adequate services
   - Appropriate materials, containers and labels
   - Approved procedures and instruments
   - Suitable storage and transport
   - Adequate qc facilities

3. Qualification and validation work is performed
4. Procedures and instructions are written in clear unambiguous language
5. Operators are trained
6. Manufacturing procedures are recorded
7. All production and distribution records are retained
8. Proper storage and distribution of products
9. Recall of any product batch
10. Complaints about product quality are investigated

General GMP guidelines include important aspects like

- Premises
- Personnel
- Equipment
- Sanitation
- Starting material
- Manufacturing operations
- Validation
- Qc systems
- Documentation etc

Premises

- Location
- Structure
- Basic design and layout
- Size, scale, and complexity of manufacturing operations
- Production area
- Storage area
- QC area
- Ancillary area

Organization & Personnel

1. Responsibilities of quality control unit.
2. Personnel qualifications.
3. Personnel responsibilities.
4. Consultants.

Equipment

1. Equipment design, size, and location.
2. Equipment construction.
3. Equipment cleaning and maintenance.
4. Automatic, mechanical, and electronic equipment.
5. Filters.

Utilities and facilities

- Design and construction features. Lighting.
- Ventilation, air filtration, air heating and cooling.
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- Plumbing. .
- Washing and toilet facilities.
- Sanitation.
- Maintenance.
- Water (of various grades)
- Steam
- Compressed air

- Various other gases
- Vacuum
- Electricity Cooling
- systems
- Dust control and collection systems
- Effluent and waste disposal systems and drainage
- Bulk solvent and other bulk liquid supply systems
- Lubrication services

Sanitation

- premises shall be cleaned
- free from accumulated waste, dust, debris
- A validated cleaning procedure shall be maintained.
- routine sanitation program and which shall indicate--

(a)Specific areas to be cleaned and cleaning intervals

(b)Cleaning procedure to be followed, including equipment and materials to be used for cleaning

(c)Personnel assigned for the cleaning operation.

Raw materials

- inventory
- maintain records as per Schedule U.
- quarantined immediately after receipt
- stored under appropriate conditions
- batch segregation and stock rotation.
- purchased from approved sources .

- labeled with the following information:

(a)name of the product

(b)Manufacturers name, address, batch number;

(c)status of the contents (e.g. quarantine, under test, released, approved, rejected)

(d)manufacturing date, expiry date, re-test date.

- Only QC passed materials should be released

Manufacturing operations

- carried out under the supervision of technical staff
- Critical steps shall be performed by trained personnel under the direct personal supervision of approved technical staff.
- The contents of all vessels and containers shall be conspicuously labeled
- *Precautions against mix-up and cross-contamination-*
- SOPs shall be maintained.
- All equipment shall be labeled with their current status.

- processing of sensitive drugs in isolated production areas with independent air-handling unit and proper pressure differential.
- Packaging lines shall be adequately segregated.
- required levels of temperature, humidity and cleanliness.
- uniforms for manufacturing operations including packaging.
- segregated enclosed areas, secured for recalled or rejected material

QC systems

- concerned with
- sampling,
- Specifications
- Testing
- Documentation release procedures.
- not just confined to laboratory operations but shall be
- involved in all decisions concerning the quality of the product.

Every manufacturing unit shall establish its own qc lab.

- area of qc lab may be divided into
- Chemical
- Instrumentation
- Microbiological
- Biological testing.
- storage conditions shall be provided for keeping reference samples.
- SOPs for sampling, inspecting and testing of
- raw materials,
- intermediate
- bulk finished products packing materials.
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Documentation

Its aim is to

- define the specifications for all materials,
- method of manufacture,
- to provide an audit trail
- designed, prepared, reviewed and controlled, wherever applicable,
- approved, signed and dated by appropriate and authorized persons.
- specify the title, nature and purpose.

- laid out in an orderly fashion and be easy to
- check. clear and legible.
- regularly reviewed and kept up to date.
- alteration made shall be signed and dated. Records and
- SOPs shall be retained
- Data may be recorded by electronic data processing systems or other reliable means, but Master Formulae shall also be available in a hard copy

GMP

- Good Manufacturing Practice
- Good Management Practice
- Get More Profit
- Give More Production

Conclusion

- The Quality of a drug depends on the Quality of those producing it
- The problem cannot be solved by tighter regulations alone.
- Continuous and professional auditing is essential to overcome the challenge of meeting stringent requirements of GMP.
- GMP is doing the right thing when nobody is watching but it will reflect in the final product being right.
- In matter of GMP, swim with the current and in matter of Quality stand like a rock!

Thank you