REVIEW ARTICLE JPAR 2018

Journal of Pharmaceutical Advanced Research
(An International Multidisciplinary Peer Review Open Access monthly Journal)
Available online at: www.jparonline.com

# A Systematic Review on Good Clinical Practices: Design and Utility

**Ishwar Chandra Giri[1*], Ankit Singh[1], Vijendra Kumar Pandey[2], Virendra Kumar Singh[3]**

[1]Dr M C Saxena College of Pharmacy, Lucknow, U.P.
[2]R R S College of Pharmacy, Amethi, U.P.
[3]Sherwood College of Pharmacy, Barabanki, U.P.

Received: 21.02.2018 Revised: 16.03.2018 Accepted: 21.03.2018 Published: 31.03.2018

**ABSTRACT:** Good Clinical Research Practice (GCP) is a process that incorporates established ethical and scientific quality standards for the design, conduct, recording and reporting of clinical research involving the participation of human subjects. Compliance with GCP provides public assurance that the rights, safety, and well-being of research subjects are protected and respected, consistent with the principles enunciated in the declaration of Helsinki and other internationally recognized ethical guidelines, and ensures the integrity of clinical research data. The conduct of clinical research is complex and this complexity is compounded by the need to involve a number of different individuals with a variety of expertise. This article illustrates the importance of GCP, defines and outlines the goals of GCP, presents a historical perspective on GCP and Outlines FDA regulations relating to GCP. GCP provides investigators and their study teams with the tools to protect human subjects and collect quality data. GCP, explain the benefits of following GCP for all types of human research and clinical trial studies, and provide some resources to assist investigators in implementing the tenets of GCP for their own research studies. GCP is likely to follow the International Conference on Harmonization of GCP guidelines in many aspects. GCP will enforce guidelines on ethical aspects of a clinical study. Higher standards will be required in terms of comprehensive documentation for the clinical protocol, record keeping, and training. Today, the GCP are used in clinical trials with the main aim of protecting and preserving human rights.

**Corresponding author***
Dr. Ishwar Chandra Giri
Dr M C Saxena College of Pharmacy,
171, Barawankala, Mall road, Dubagga-IIM by Pass, Lucknow-226001, U.P.
E. Mail ID. icgiripharma@gmail.com
Tel. No. +919198564284.

**Key words**: Good Clinical Practice (GCP), ICH-GCP, Quality assurance, Inspections, Clinical trial, Human rights protection, FDA.

## INTRODUCTIONS:

GCP is a key requirement for anyone involved in the conduct of clinical research is Good Clinical Practice (GCP) training. GCP is the standard and guidelines to which all research is conducted.GCP is a set of internationally recognized ethical and scientific quality requirements that must be observed throughout the various stages of a clinical trial. Clinical trial following testing in laboratories and animal studies, the most

promising treatments is moved into clinical trials [1]. A clinical trial is sometimes called a clinical study [2]. A clinical trial is a research study that tests how well an intervention works in a group of people, tests for new methods of screening, prevention, diagnosis, or therapy and is conducted in phases. During a trial, additional information is learned about an intervention, its risks, and its effectiveness and/or efficacy. Good clinical practices refer to an international standard of quality as per as ICH guideline for human valuenters.GCP standards offer assurance as to the effect and safety of compounds developed in clinical trials, human rights protection of trial participants, and also define the roles of clinical research investigators, clinical trial sponsors and clinical research associates [3-5].

It aims to ensure that the studies are scientifically and ethically sound and that the clinical properties of the pharmaceutical substances under investigation are properly documented. The guidelines provide protection of the rights of human subjects and authenticity of biomedical data generated. It also ensures that the studies are implemented and reported in such a manner that there is public assurance that the data are credible, accurate and that the rights, integrity and confidentiality of the subjects are protected [6]. Now days, pharmaceutical companies that are involved in clinical trials are being trailed by a growing concern over the clinical research ethics followed in India. Global pharmaceutical companies are outsourcing their projects to India for several reasons: enhancing profit, cutting the cost of drug development and speeding regulatory approval, and.

Clinical trials are cheaper in India compared to other countries. The reasons for low cost of drug development are cheap human resource, low recruitment cost and lower rate of compensation for any injury sustained or death during the research process. In fact, CROs even recruit patients without any formal assurance of compensation because a large proportion of participants in India are illiterate and lured into trials by offers of free healthcare and financial inducements. However, they are often unaware of the benefits and risks of taking part in a trial, and many may not even be able to distinguish between treatment and research. In addition, the concept of informed consent before enrolling in a trial is not very clear. A clinical trial is a research study that tests a new medical treatment or a new way of using an existing treatment to see if it will be a better way to prevent and screen for diagnose or treat a disease [7-9]. For any new drug to enter in clinical trial, it must pass preclinical studies. Preclinical studies involve in vitro (i.e. test-tube or Laboratory) studies and trials on animal populations. When we find in pre-clinical studies that the drug molecule in safe to be tested in humans an IND is made to drug controller of India wide range of dosages of the study drug is given to animal subjects or to an in-vitro substrate in order to obtain preliminary efficacy, toxicity and pharmacokinetic information [10].

## INTERNATIONAL CONFERENCE ON HARMONIZATION (ICH)-GCP:

The ICH of technical requirements for registration of pharmaceuticals for human use is unique in bringing together the regulatory authorities and pharmaceutical industry of Europe, Japan and the US to discuss scientific and technical aspects of drug registration [7,8]. The guideline was developed with consideration of the current good clinical practices of the European Union, Japan, and the United States, as well as those of Australia, Canada, the Nordic countries and the World Health Organization (WHO). This guideline should be followed when generating clinical trial data that are intended to be submitted to regulatory authorities. The principles established in this guideline may also be applied to other clinical investigations that may have an impact on the safety and well-being of human subjects [11-14]. So the clinical trials should be as per as ICH/WHO which will be provide GCP standard. Clinical studies should be carried out according to International Conference on Harmonization (ICH)/WHO Good Clinical Practice standards. Any country that adopts this guideline technically follows this same standard [15-17].

## ICH GCP GUIDELINES:

The principles of ICH GCP are [18]:

- Clinical trial should be conducted in accordance with the ethical principles that have their origin in the declaration of Helsinki, and that are consistent with GCP and the applicable regulatory requirement.
- Before a trial is initiated, foreseeable risks should be monitored.
- The clinical studies should be prevailing over interests of science and society.
- The available nonclinical and clinical information on an investigational product should be adequate to support the proposed clinical trial.
- Clinical study should have clear and all protocol.

- A trial should be conducted in compliance with the protocol that has received prior institutional review board (IRB) independent ethics committee (IEC) approval / favorable opinion.
- The medical care given to and medical decisions made on behalf of, subjects should always followed by qualified physician.
- Freely given informed consent should be obtained from every subject prior to clinical trial participation.
- Full detail information should be recorded, handled, and stored in a way that allows its accurate reporting, interpretation and verification.
- The confidentiality of records that could identify subjects should be protected, respecting the privacy and confidentiality rules in accordance with the applicable regulatory requirement.
- Investigational products should be manufactured, handled, and stored in accordance with applicable GMP. They should be used in accordance with the approval protocol.

**ICH GUIDELINES:**

In Recognition of the international market place for pharmaceutical and in an effort to achieve global efficiency for both regulatory agencies and the pharmaceutical industry, the FDA, counterpart agencies of the European Union and Japan and geographic representatives of the pharmaceutical industry formed a tripartite organization in 1991 to discuss, identify, and address relevant regulatory issues. This organization, named the international conference on Harmonization of Pharmaceuticals for Human Use (ICH) has worked toward harmonizing, or bringing together, regulatory requirements with the long-range goal of establishing a uniform set of standards for drug registration within these geographic areas. The ICH's work toward uniform standards is focused on three general areas, quality, safety and efficacy. The quality topic includes stability, light stability, analytical validation, impurities, and biotechnology.

The safety topics include carcinogenicity, genotoxicity, toxicokinetics, reproduction toxicity and single and repeat dose toxicity. The efficacy topics include population exposure, managing clinical trials, clinical study reports, dose response, ethic factors, good clinical practices, and geriatrics. For each topic, relevant regulations are identified, addressed and consensus guidelines developed. The intension is that these guidelines will be incorporated in to domestic regulations. United states guidelines are published in the Federal Register as notices, with accompanying statements indicating that the guideline should be "Useful" or "considered" by applicants conducting required studies or submitting registration applications.

It should be in proper protocol [19]:

- Stability testing of new drug substances and products.
- Analytical method of validation should follow for Pharmaceuticals.
- Impurities in new drug substances and products.
- General consideration for clinical studies.

**PRINCIPLES OF GCP:**

The clinical trials should be scientifically and it follows the ethical regulation in all their aspects. The important guideline to secure the quality of each aspect of trial shall compile with standard specification. The clinical study shall subject to safety, right, and well- being over the interests of science and society. The all who involved in clinical trials should be qualified, trained and experienced to perform his tasks. The available non-clinical and clinical information on an investigational medicinal product shall be adequate to support the proposed clinical trial.

- Clinical trials shall be conducted in accordance with the principles of the Declaration of Helsinki.
- The protocol shall provide for the definition of inclusion and exclusion of subjects participating in a clinical trial, monitoring and publication policy.
- The investigator and sponsor shall consider all relevant guidance with respect to commencing and conducting a clinical trial.
- All clinical information shall be recorded, handled and stored in such a way that it can be accurately reported, interpreted and verified, while the confidentiality of records of the trial subjects remains protected.
- Risks and inconvenience should be foreseeable against the anticipated benefit for the individual trial subject and other present and future patients.
- The medical care given to, and medical decisions made on behalf of, subjects shall always be the responsibility of an appropriately qualified doctor or, when appropriate, of a qualified dentist.
- A trial shall be initiated only if an ethics committee and the licensing authority comes to the conclusion that the anticipated therapeutic and public health

benefits justify the risks and may be continued only if compliance with this requirement is permanently monitored.
- The rights of each subject to physical and mental integrity, to privacy and to the protection of the data concerning him in accordance with the Data Protection Act 1998 are safeguarded.
- Provision has been made for insurance or indemnity to cover the liability of the investigator and sponsor which may arise in relation to the clinical trial.

## OVERVIEW OF THE CLINICAL RESEARCH PROCESS:

**Key trial activities include [20-22]:**

- Development of the trial protocol, development of Standard Operating Procedures (SOPs) and Development of support systems and tools.
- Generation and approval of trial-related documents and Selection of trial sites and the selection of properly qualified, trained, and experienced investigators and study personnel.
- Ethics committee review and approval of the protocol and Review by regulatory authorities and Enrollment of subjects into the study: recruitment, eligibility, and informed consent.
- The investigational product(s): quality, handling and accounting and Trial data acquisition: conducting the trial.
- Safety management and reporting, monitoring the trial and managing trial data.
- Quality assurance of the trial performance data and Reporting the trial.

**Common GCP issue during Clinical Studies**

**Informed consent:**

- Length of consent form.
- Documentation - of contacts, in source files etc.
- Translations.
- Ethics committee approval and information to ongoing patients.

**Clinical trial supplies:**

Validated of Randomization errors includes;

- Accountability problems.
- Improper storage conditions.
- Compliance issues.
- Blind breaking issues.

## PHASES OF CLINICAL TRIAL:

Before pharmaceutical companies start clinical trials on a drug, they conduct extensive pre-clinical studies [23].

**Pre-clinical studies:**

Pre-clinical studies involve *in vitro* (i.e., test tube or laboratory) studies and trials on animal populations.

**Phase 0 (Pre Phase-I, Pilot Study):**

Pre Phase - I is a recently designed for exploratory, first-in human trials conducted in accordance with the USFDA, in 2006 Guidance on Exploratory Investigational New Drug (IND) Studies. In Phase 0 administration of single sub therapeutic doses of the study drug to a small number of subjects (10 to 15) to gather preliminary data on the drug to find it's pharmacokinetic and pharmacodynamic profiles.

**Phase I (Human Pharmacology Studies):**

Phase I trials is being for check safety and tolerability. Phase I trials are the first stage of testing in human subjects. Normally, a small (20-80) group of healthy volunteers will be selected. This phase includes trials designed to assess the safety (Pharmacovigilance), tolerability, pharmacokinetics, and pharmacodynamics of a drug.

Phase I trials most often include healthy volunteers. However, there are some circumstances when real patients are used, such as patients who have end-stage disease and lack other treatment options. This exception to the rule most often occurs in oncology (cancer) and HIV drug trials. Volunteers are paid an inconvenience fee for their time spent in the volunteer centre.

There are different kinds of Phase I trials:

***SAD (For Confirmation of Safety only):***

Single Ascending Dose studies are those in which small groups of subjects are given a single dose of the drug while they are observed and tested for a period of time. If they do not exhibit any adverse side effects, and the pharmacokinetic data is roughly in line with predicted safe values, the dose is escalated, and a new group of subjects is then given a higher dose. This is continued until recalculated pharmacokinetic safety levels are reached, or intolerable side effects start showing up at which point the drug is said to have reached the Maximum tolerated dose (MTD).

***MAD (For Conformation of Safety and Tolerability both):***

Multiple Ascending Dose studies are conducted to better understand the pharmacokinetics & pharmacodynamics of multiple doses of the drug.

**Phase II:**

Phase II A- design to assess how much drug should be given. Phase II A- design to study that how well the drug works. Once the initial safety of the study drug has been confirmed in Phase I trials, Phase II trials are performed on larger groups (20-300) and are designed to assess how well the drug works, as well as to continue Phase I safety assessments in a larger group of volunteers and patients.

When the development process for a new drug fails, this usually occurs during Phase II trials when the drug is discovered not to work as planned, or to have toxic effects. Phase II studies are sometimes divided into Phase IIA and Phase IIB. Phase IIA is specifically designed to assess dosing requirements (how much drug should be given), whereas Phase IIB is specifically designed to study efficacy (how well the drug works at the prescribed dose(s)). Phase ii trials are also called therapeutic exploratory trials.

**Phase III:**

Phase III studies are also called therapeutic confirmatory trials. Phase III are randomized controlled multicenter trials on large patient groups (500–3,000 or more depending upon the disease/medical condition studied) and are aimed at being the definitive assessment of how effective the drug. Because of their size and comparatively long duration, Phase III trials are the most expensive, time-consuming and difficult trials to design and run, especially in therapies for chronic medical conditions.

Once a drug has proved satisfactory after Phase III trials, the trial results are usually combined into a large document containing a comprehensive description of the methods and results of human and animal studies, manufacturing procedures, formulation details, and shelf life. This collection of information makes up the "regulatory submission" that is provided for review to the appropriate regulatory authorities in different countries.

Most drugs undergoing Phase III clinical trials can be marketed under FDA norms with proper recommendations and guidelines, but in case of any adverse effects, being reported anywhere, the drugs need to be recalled immediately from the market. While most pharmaceutical companies refrain from this practice, it is not abnormal to see many drugs undergoing Phase III clinical trials in the market.

**Phase IV (Marketing Studies or Experience Studies):**

Phase IV studies are defined as those studies performed with drugs that have been granted marketing authorization. Phase IV differ from post marketing surveillance (Pharmacovigilance) which is observational and interventional intended mainly to monitor the safety of a marketed drug. The role of Phase IV trials are to extend knowledge about drug efficacy and to confirm the safety of new drug in a wider patient population treated with that drug after its approval for marketing.

**INVESTIGATIONAL NEW DRUG (IND) / CLINICAL TRIAL EXCEPTION (CTX) / CLINICAL TRIAL AUTHORIZATION (CTA) APPLICATION:**

An Investigational New Drug Application is to provide the data showing that it is reasonable to begin testes of a new drug on humans we can say that it is the result of a successful preclinical studies. INDs (in the U.S.), CTXs (in the U.K.) and CTAs (in Australia) are examples of requests submitted to appropriate regulatory authorities for permission to conduct investigational research. This research can include testing of a new dosage form or new use of a drug already approved to be marketed. In addition to obtaining permission from appropriate regulatory authorities, an Institutional or Independent Review Board (IRB) or Ethical Advisory Board must approve the protocol for testing as well as the informed consent documents that volunteers sign prior to participating in a clinical study. An IRB is an independent committee of physicians and community advocates that ensures a clinical trial is ethical and the rights of study participants are protected [24].

**NEW DRUG APPLICATION (NDA) / MARKETING AUTHORIZATION APPLICATION (MAA):**

NDAs (in the U.S.) and MAAs (in the U.K.) are examples of applications to market a new drug. Such application document safety and efficacy of the investigational drug and contain all the information collected during the drug development process. At the conclusion of successful preclinical and clinical testing, this series of documents is submitted to the FDA in the U.S. or to the applicable regulatory authorities ion other countries. The application must present substantial evidence that the drug will have the effect it is represented to have when people use it or under the conditions for which it is prescribed recommended or

suggested in the labeling. Obtaining approval to market a new drug frequently takes between six months and two years [25,26].

**TYPES OF CINICAL TRIAL:**

**Treatment trials:**

Test experimental treatments, new combinations of drugs, or new approaches to surgery or radiation therapy.

**Prevention trials:**

Look for better ways to prevent disease in people who have never had the disease or to prevent a disease from returning. These approaches may include medicines, vitamins, vaccines, minerals, or lifestyle changes.

**Diagnostic trials:**

Conducted to find better tests or procedures for diagnosing a particular disease or condition.

**Screening trials:**

Test the best way to detect certain diseases or health conditions.

**Quality of Life:**

Trials (or Supportive Care trials) explore ways to improve comfort and the quality of life for individuals with a chronic illness [27].

**MONITORING CLINICAL TRIALS:**

The purposes of trial monitoring are to verify that the rights and well being of human subjects are protected, the reported trial data are protected and the conduct of the trial is incompliance with the currently approved protocol/amendment (s), with GCP, and with the applicable regulatory requirement (s).

**COMPLIANCE WITH PROTOCOL:**

The investigator/institution should conduct the trial in compliance with the protocol agreed to by the sponsor and, if required, by the regulatory authorities and which were given approval/ favorable opinion by the IRB/ IEC. The investigator/ institution and the sponsor should sign the protocol, or an alternative contract, to confirm agreement. The investigator should not implement in deviation from, or changes of the protocol without agreement by the sponsor and prior review and documented approval/ favorable opinion from the IRB/ IES of an amendment, except where necessary to eliminate an immediate hazard(s) to trial subject, or when the change(s) involves only logistical or administrative aspect of the trial (e.g. change in monitor (s), change of telephone no. (s). The investigator, or person designated by the investigator, should document and explain any deviation from the approved protocol.

The investigator may implement a deviation from, or a change of the protocol to eliminate an immediate hazard(s) to trial subjects without prior IRB/IEC approval/ favorable opinion. As soon as possible, the implemented deviation or change, the reasons for it, and if appropriate, the proposed protocol amendment(s) should be submitted [28].

- To the IRB/IEC for review and approval/favorable opinion.
- To the sponsor for agreement.
- To the regulatory authority (IES).

**ETHICAL CONDUCT:**

Clinical trials should be conducted according to autonomy, beneficence, no harm and justice principle.. Appropriate regulatory authorities closely supervise clinical trials. In the U.S., this body is called the Institutional Review Board (IRB). Most Ribs are located at the local investigator's hospital or institution, but some sponsors allow the use of a central (independent/for profit) IRB for investigators who work at smaller institutions. To be ethical, researchers must obtain the full and informed consent of participating human subjects.

International Conference of Harmonization Guidelines for Good Clinical Practice (ICH GCP) is a set of standards used internationally for the conduct of clinical trials. The guidelines aim to ensure that the "rights, safety and well being of trial subjects are protected". The declaration of Helsinki of the World Medical Association (1964) codifies recommendation for guidance of doctors in clinical research [29,30].

**CONCLUSION:**

Ongoing research shows that whether conducting research involving a new drug, a behavioral intervention, or an interview/ survey, Good Clinical Practice (GCP) provides investigators and their study teams with the tools to protect human subjects and collect quality data. In this article, the author will define GCP, explain the benefits of following GCP for all types of human research studies, and provide some resources to assist investigators in implementing the tenets of GCP for their own research studies.

This article illustrates the importance of Good Clinical Practice (GCP), defined and outlined the goals of GCP, Presented a historical perspective on GCP, Outlined FDA regulations relating to GCP. GCP will enforce tighter guidelines on ethical aspects of a clinical study.

Higher standards will be required in terms of comprehensive documentation for the clinical protocol, record keeping, training, and facilities including computers. The additional requirements of GCP are discussed and any advantage to the study subject. GCP aims to ensure that the studies are scientifically authentic and that the clinical properties of the investigational product are properly documented. In this paper, we address the background history and the events that led up to the formation of these guidelines. Today, the GCP are used in clinical trials throughout the globe with the main aim of protecting and preserving human rights. GCP is an international ethical and scientific quality standard for designing, conducting, recording and reporting trials that involve the participation of human subjects.

**ACKNOWLEDGEMENTS:**

Authors wish to thanks Dr M C Saxena College of Pharmacy, R R S College of Pharmacy and Sherwood College of Pharmacy, for providing library and literature survey facilities to carry out this review study.

**REFERENCES:**

1. Bhandari M, Busse JW, Jackowski D, Montori VM, Schunemann H. Association between industry funding and statistically significant pro-industry findings in medical and surgical randomized trials. CMAJ, 2004; 170: 477-480.
2. Gad SC, editor. Clinical Trials Handbook. Hoboken, New Jersey: John Wiley & Sons Inc; 2009: 501-517.
3. Meinert CL, Tonascia S. Clinical trials: design, conduct, and analysis. USA: Oxford University Press; 1986.
4. Van Dongen AJ. Good Clinical Practice, a transparent way of life. A review. Comput Med Imaging Graph, 2001; 25: 213-216.
5. Vijayananthan A, Nawawi O. The importance of Good Clinical Practice guidelines and its role in clinical trials. Biomed Imaging Interv J, 2008: 4(1): e5.
6. Bavdekar SB, Gogtay NJ, Wagh S. Reporting Ethical Processes in Two Indian Journals. Indian J Med Sci, 2008; 62: 134–140.
7. Food Drug Administration (FDA). International conference on harmonization, good clinical practice: consolidated guidelines. Federal Register, 1997: 62: 25692–25709.
8. EMEA. Clinical Investigation of Medicinal Products in the Pediatric Population. 2000.
9. EMEA. ICH Topic E 6 (R1): Guideline for Good Clinical Practice. 2001.
10. EMEA. ICH E10: Choice of Control Group and Related Issues in Clinical Trials. 2001.
11. Otte A, Maier-Lenz H, Dierckx RA. Good Clinical Practice: Historical background and key aspects. Nucl Med Commun, 2005; 26: 563-574.
12. Kapil Verma. Base of a Research: Good Clinical Practice in Clinical Trials. J Clin Trials, 2013; 3(1): 1-5.
13. Smith A. Still relevant after all these years? Should ICH GCP be Reviewed and Revised? 2009.
14. Vadivale M. ICH-GCP Guidelines for Clinical Trials. Berita: MMA; 1999.
15. Malaysian Guidelines for Good Clinical Practice. 2nd ed. Malaysia: Ministry of Health Malaysia; 2004.
16. ICH. ICH M3 Maintenance of the ICH Guideline on Non-Clinical Safety Studies for the Conduct of Human Clinical Trials for Pharmaceuticals. 1997.
17. European Parliament. Directive 2001/20/EC of the European Parliament and of the Council of 4 April 2001 on the approximation of the laws, regulations and administrative provisions of the Member States relating to the implementation of good clinical practice in the conduct of clinical trials on medicinal products for human use. J Europ Communities, 2001; 121: 34-44.
18. European Medicines Agency. ICH Harmonized Tripartite Guideline E6: Note for Guidance on Good Clinical Practice (PMP/ICH/135/95). London: European Medicines Agency; 2002.
19. ICH Harmonized Tripartite Guideline for Good Clinical Practice. London: Academy For Clinical Excellence; 2000.
20. Allen LV, Poporich NG, Ansel HC. Pharmaceutical Dosage Forms and Drug Delivery System. 8th ed. New York: B I Publications Pvt. Ltd; 2005. pp. 45-65.
21. The National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. USA: U.S. Department of Health, Education, and Welfare; 1979.

22. Steinbrook R. Protecting research subjects—the Crisis at Johns Hopkins. J Med, 2002; 346: 715–720.
23. Emanuel E. Ending concerns about undue inducement. J Law Med Ethics, 2004; 32: 100–105.
24. Emanuel E, Wendler D, Grady C. What makes clinical research ethical? J Am Med Assoc, 2000; 283: 2701–2711.
25. Council for International Organizations of Medical Sciences. (CIOMS)- International Ethical Guidelines for Biomedical Research Involving Human. Health and Human Services Regulations for the Protection of Human. 2002.
26. Kulkarni SK. Hand Book of Experimental Pharmacology. 3rd ed. New Delhi: Vallabh Prakashan; 2004. pp. 21-29.
27. Itkar S. Pharmaceutical Management. 3rd ed. Pune: Nirali Prakashan; 2007. pp. 13.4-13.5.
28. Barar FSK. Essential of Pharmacotherapeutics. 4th ed. New Delhi: S. Chand and Company Ltd; 2007. pp. 57-59.
29. ICH: ICH harmonized tripartite guideline for good clinical practice E6 (R1). International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use. 1999.
30. Good Clinical Practice: Consolidated Guidelines. International Conference on Harmonisation, 1997.

**Conflict of Interest:** None

**Source of Funding:** Nil

**Paper Citation:** Giri IC, *et al*. A Systematic Review on Good Clinical Practices: Design and Utility. J Pharm Adv Res, 2018; 1(2): 76-83.