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**Original Research Article**

# Awareness on storage of drugs that should be protected from light among nursing professionals in a tertiary care teaching hospital

**Venkata Ravikumar Chepuri[1]*, Shaik Kareemulla[2], Chandana T.[2], Radhika J.[2], Ascharya Ch.[2], Sudharani K.[2]**

[1]Department of Medicine, Rajiv Gandhi Institute of Medical Sciences, Kadapa. Andhra Pradesh, India
[2]Department of Pharmacy Practice, P. Rami Reddy Memorial College of Pharmacy (PRRMCP), Kadapa, Andhra Pradesh, India

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***Correspondence:**
Dr. Venkata Ravikumar Chepuri,
E-mail: ravi657chepuri@gmail.com



## ABSTRACT

**Background:** Despite of prescribing and administration of drugs to the patient, handling of drugs with utmost care by proper storage and use helps the drug not to lose its potency when administered to a patient. Storage is an important aspect of the total drug control system. There is a need to increase awareness among nurse so as to avoid treatment failure. Exposure to light is a concern with numerous medications due to the potential for photodegradation or other chemical reactions that affect drug stability.
**Methods:** This study was conducted on nursing professionals and students (BSc) students 1st year /2nd year, working in different departments of Inpatient and Outpatient in a tertiary care teaching hospital of RIMS Kadapa. The data was collected by using structured knowledge questionnaire on proper storage of drugs that should be protected from light which consists of 20 items, based on their answers score was given1-10.
**Results:** Among 50, the highest number was occupied by staff nurses (28), followed by head nurses (12), student nurses (8) and the least was nursing officers (2). Majority of them were B.Sc. qualified (26), followed by general nursing (10). The M.Sc and diploma qualified nurses were seven and six in number respectively. Based on scoring they were classified as POOR (<5) 13, AVERAGE (5-10) 24, GOOD (>10) 13.
**Conclusions:** In this study half of the nursing professionals have average knowledge on storage of light sensitive drugs irrespective of their experience, so there is a need to increase awareness on storage of light sensitive drugs.

**Keywords:** Light sensitive drugs, Nurse, Photodegradation

## INTRODUCTION

Exposure to light is a concern with numerous medications due to the potential for photo degradation or other chemical reactions that affect drug stability.[1] In 2009, Hospital Pharmacy published a list of oral medications that require protection from light.[2] To our knowledge prescribing information (PI) was used as the primary reference for each injectable medication. Additional resources were used to confirm this information. Therefore, the purpose of this list is to supplement the published list medications that are available in this hospital premises and should be protected from light. All medicinal products should be stored in a secure manner, either in a locked cupboard or room. They should be stored in the appropriate environment as indicated on the

label or packaging of the medicinal product or as advised by the pharmacist.[3]

Light can influence the active principle in a drug formulation, as well as the final product or package. In this manner, the photostability deals with the effect of the light (photons) on stability of pharmaceutical substances. Photodegradation may be observed as bleaching or as discoloration of products. The other effects include cloudy appearance of the product, a loss in viscosity of formulation, precipitation of active principle, alteration in dissolution rate, although many drugs are found to decompose when exposed to light.[4]

Aim and objectives of the study were to assess the awareness on storage of drugs that should be protected from light among nursing professionals in a tertiary care teaching hospital.

## METHODS

This study was conducted on nursing professionals and students (BSc) students, working in different departments of Inpatient and Outpatient in RIMS a 750 bedded tertiary care teaching hospital- of RIMS Kadapa, from august 2018 to December 2018. The data was collected by using structured knowledge questionnaire on proper storage of drugs that should be protected from light which consists of 20 items, based on their answers score was given1-10. The investigator obtained permission from the authorities of the college, prior to the data collection and assured confidentiality to the subject to get their cooperation and explained the purpose of the study. The results were analyzed through descriptive and inferential statistics.

### *Inclusion criteria*

Nursing professionals working in different departments of Inpatient and Outpatient in RIMS who are willing to participate in the study.

### *Exclusion criteria*

Other health care professionals and nursing staff who are not willing to participate were excluded from the study.

## RESULTS

During the study the answers given by the nursing professionals to the asked questionnaire was categorized based on scoring i.e., <5, 5-10, >10. (Table 1). Are with scoring <5 and are from 5-10 and remaining are with >10. Authors have taken 50 nursing professionals of inpatient and outpatient departments of RIMS and questionnaires were disseminated to each of them. We have analyzed the results based on experience (Table 2), designation, qualification and given score they have attained. Among 50, the highest number was occupied by staff nurses (28), followed by head nurses (12), student nurses (8) and the least was nursing officers (2). Majority of them were B.Sc. qualified (26), followed by general nursing (10). The M.Sc. and diploma qualified nurses were seven and six in number respectively. Based on scoring they were classified as POOR (<5) 13, AVERAGE (5-10) 24, GOOD (>10) 13.

**Table 1: Distribution based on level of knowledge.**

| S. no. | Category | No. of participants |
|---|---|---|
| 1 | Poor (<5) | 13 |
| 2 | Average (5-10) | 24 |
| 3 | Good (>10) | 13 |

**Table 2: Distribution based on experience.**

| S. no. | Experience (Yrs) | No. of participants |
|---|---|---|
| 1 | 0-10 | 24 |
| 2 | 20 | 5 |
| 3 | >20 | 13 |
| | Total | 41 |
| | Student nurses =9 | 41+9 =50 |

## DISCUSSION

The actual definition of photostability is the response of the drug or drug product to the exposure to solar, UV, and visible light in the solid, semisolid, or liquid state that leads to a physical or chemical change.[5] The photoproducts of a drug may be harmful and cause phototoxic, photoallergic, or photosensitization reactions upon administration. The biological consequences of the action of light on drugs undergoing photodegradation are important. These include several adverse biological reactions involving phototoxicity, photo allergy, photosensitization, and others.[6,7]

In a recent study, authored by Singh J, Dwivedi A et al, concluded that Ambient UV-B exposure reduces the binding of ofloxacin with bacterial DNA gyrase and induces DNA damage mediated apoptosis.[8] Another study, which was done by Chopra C, Tripathi A et al, reported that under ambient UVA exposure, pefloxacin exhibits both immunomodulatory and genotoxic effects via multiple mechanisms.[9]

Product instability may lead to under medication due to lowering of active drug concentration in dosage form and drug decomposition leads to formation of toxic products. Instability leads to changes in physical appearance.[10] Some compounds may decompose only to a smaller extent after several weeks' exposure, while others like 1, 4-dihydropyridine derivatives (Nifedipine) have a photochemical half-life of only a few minutes. All these drugs are sensitive to light, but same precautions may not be necessary in all the cases. Light sensitive drugs can be affected by sunlight (ultraviolet light) or by artificial light (like fluorescent light).[11]

As the patient care and safety is of superior importance in health care system, the members of health care team should be aware of these hazards and the measures to be taken to avoid these errors in hospital setting. There are number of prescribed procedures to store the various formulations and dosage forms of the medicinal products. Educating the nursing professionals regarding these issues will be highly beneficial as they directly involved in the aspects of storage and maintenance of the medicines.[12,13]

## CONCLUSION

Health personnel need a thorough knowledge of the proper storage of the drugs. Nurses should be aware of the various drugs that should be protected from light and it should be included in the curriculum which will provide an awareness towards proper storage of drugs. In this study the half of the nursing professionals have average knowledge on storage of light sensitive drugs irrespective of their experience, so there is need to create awareness on storage of light sensitive drugs.

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## REFERENCES

1. University of Illinois at Chicago College of Pharmacy, Drug Information Group Light Sensitive Injectable Prescription Drugs, Hosp Pharm. 2014;49(2):136-3.
2. King AR. Light Sensitive Oral Prescription Drugs. Hosp Pharm. 2009;44(12):1112-4.
3. Guidance to nurses and midwives on medication management; 2007. Available at: http://hdl.handle.net/10147/91100. Accessed 10 August 2018.
4. Sanjay B. Dinesh S, Stability of Testing of Pharmaceutical Products. J Applied Pharm Sci. 2012:2(3):129-38.
5. Ahmad I, Ahmed S, Anwar Z, Sheraz MA, Sikorski M. Photostability and photostabilization of drugs and drug products. Int J Photoener. 2016;2016.
6. Van Henegouwen GB. Medicinal photochemistry: phototoxic and phototherapeutic aspects of drugs. Advances in drug research. 1997 Jul 21;29(79).
7. Moan J. Benefits and adverse effects from the combination of drugs and light, in Photostability of Drugs and Drug Formulations, H. H. Tonnesen, Ed., Taylor and Francis, London, UK; 1996:173-188.
8. Singh J, Dwivedi A, Mujtaba SF, Singh KP, Pal MK, Chopra D, et al. Ambient UV-B exposure reduces the binding of ofloxacin with bacterial DNA gyrase and induces DNA damage mediated apoptosis. Int J Biochem Cell Biol. April 2016;73:111-26.
9. Singh J, Srivastva AK, Mandal P, Chandra S, Dubey D, Dwivedi A, et al. Under ambient UVA exposure, pefloxacin exhibits both immunomodulatory and genotoxic effects via multiple mechanisms. J Photochem Photobiol B: Biology. 2018 Jan 1;178:593-605.
10. Subrahmanyam CV. Textbook of physical pharmaceutics; 2nd Ed, New Delhi; Vallabh Prakashan; 2000:51-84.
11. Welankiwar A. IRJP, Photo stability Testing of Pharmaceutical Products. Int Res J Pharm. 2013;4(9):11-5.
12. East Cheshire NHS Trust. Dispensing and Storage of Medicines Policy, The Medicines Management Group. Version 2.0 February 2017:18. Available at: http://www.eastcheshire.nhs.uk/About-The-Trust/policies/M/Medicines%20Policy%20-%20Dispensing%20and%20Storage%20ECT2709.pdf
13. Shafaat K, Hussain A, Kumar B, ul Hasan R, Prabhat P, Kumar Yadav V. An overview: storage of pharmaceutical products. World J Pharm Pharmaceut Scien. 2013 Jul 25;2(5):2499-515.

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