



ISSN: 2395-6429

EFFECTS OF RNASE A AND DRUG METOSARTAN IN TESTIS TISSUE

Eswari Beeram*, Thyagaraju Kedam and Bukke Suman

Department of Biochemistry, Sri Venkateswara University, Tirupati-517502, A.P, India

ARTICLE INFO

Article History:

Received 19th July, 2017

Received in revised form 25th

August, 2017

Accepted 25th September, 2017

Published online 28th October, 2017

ABSTRACT

Chromatin organisation disturbance is one of the main reasons for infertility in both women and men. Apoptosis has proven to be responsible for collapse of chromatin and up to now there is no remedy for prevention of apoptosis that occurs in adverse amounts, during certain conditions and diseases. Treatment with RNase A along with the drug metosartan has led to new finding in re- recovery of structural organisation.

Key words:

Aniline Blue., Maldi- Tof.,
Metosartan., masea., Apoptotic
Bodies

Copyright © 2017 Eswari Beeram et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Chromatin is a highly organized Structure Comprising of DNA, histones and RNA. The Function of chromatin includes fitting to the Actual space available inside the cell, gene Expression and also DNA replication in the cell. In the cell a 40kd DNA fragmentation protein acts as endonuclease and makes oligonucleotide cuts which is required for packing of chromatin(1). There are reports of infertility which seems to be increased from 42million to 48 million in 2010(2). Collapse of chromatin due to apoptosis can be the one of the main reason for infertility in both (5) women and men which yet has to be proved. Apoptosis is a boon in case of removal of unwanted cells and debris but it is promising a ban when it occurs in more than to normal. RNaseA is one of the endoribonuclease discussed here that cleaves the phosphodiester bond present between 5' ribose nucleotide and the 3' phosphate of adjacent ribose nucleotide. Recent work has given conclusion that the synthesis and maturation of RNase A occurs in endoplasmic reticulum (5) which is a small protein consisting of 129 amino acids where as RNase10 an epididymal protein which has homology to that of RNase A of pancreas has shown to be involved in post testicular maturation and fertility. RNase protection to apoptosis is extremely a new topic where as RNase protection in other cases such as virus protection (3), in soft tissues (4) were studied already.

RESULTS

The samples was analysed based on their appearance of chromatin organisation. The control which contains only PBS showed normal chromatin which is clear from the figure 1. PBS provides the required physiological conditions but due to lack of required gene expression of the structural maintenance proteins there is disturbance in the organisation of chromatin. This may be the reason for collapse of chromatin. It explains that collapse of chromatin is mainly due to lack of DNA replication and gene expression but not due to apoptosis which can be explained by the absence of DNA fragmentation in the sample. DNA replication is also a necessary requirement for Chromatin organisation. Histone proteins phosphorylation is one of the major reasons for the collapse of chromatin and also the salt concentration present in the PBS also. RNase treatment of testis clearly Showed cleavage of chromatin which proves that RNA is also one of the Structural component of chromatin and also formation of apoptotic bodies seen in the sample for removal of degraded nuclear Material and debris which is clear from the figure2. RNase A is involved in Processing of RNAs which is also a reason for chromatin maintenance which when disturbed leads to imbalance which explains that there is RNase A dependent chromatin maintenance. Treatment with drug and RNase A Resulted in recovery Which can be made clear from the Figure 3. Repair of apoptotic bodies and regain in the structural organisation of chromatin to some extent was seen with this study.

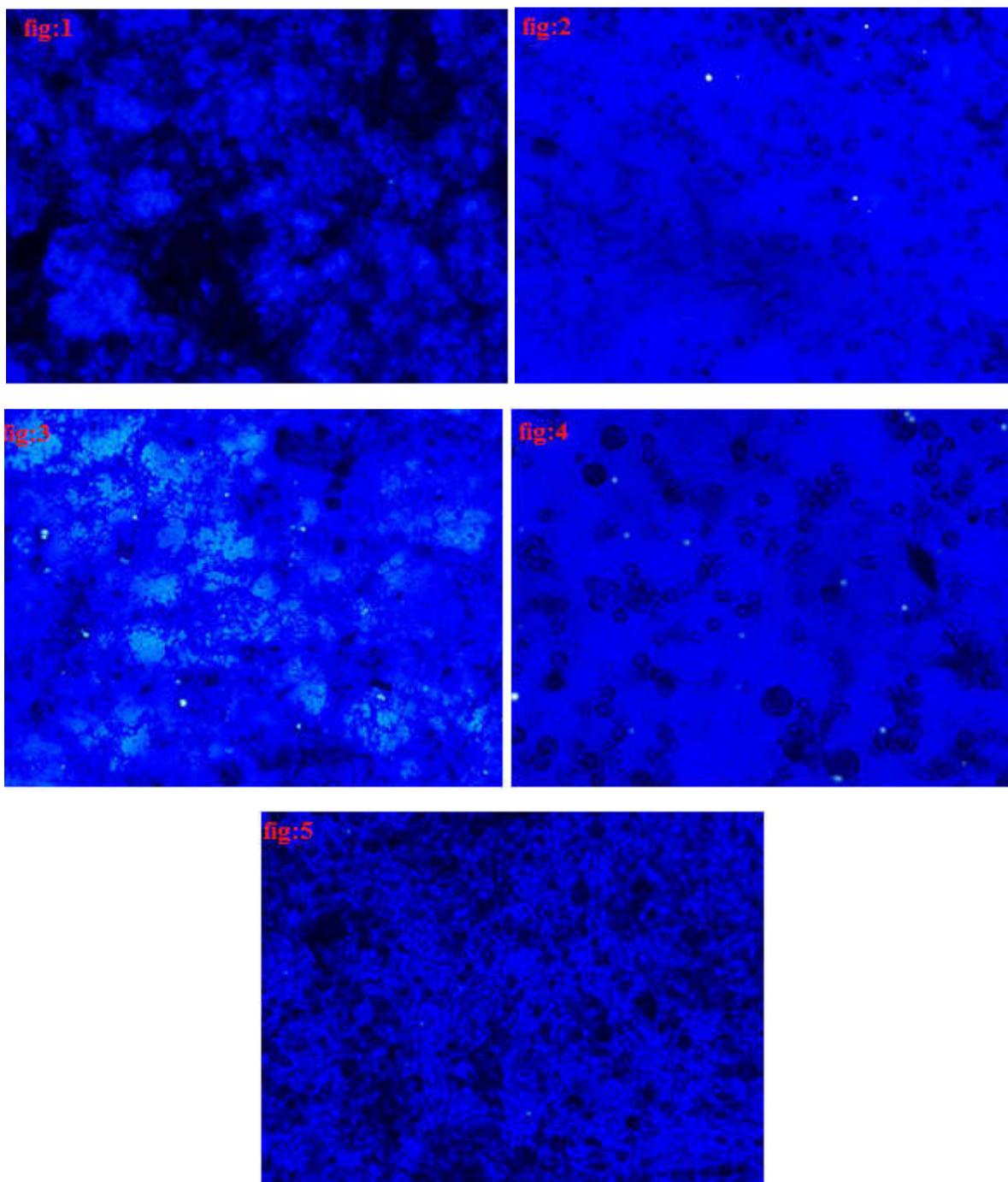


Figure 1-5 Microscopic analysis of testis smears in invitro condition. **Figure 1** control sample of testis treated with PBS itself. Compact chromatin is seen . DNA fragmentation is absent. Apoptosis is absent and the chromatin is mature . **Figure 2** sample of testis treated with RNase A. chromatin cleavage is seen as RNA is also a part of chromatin . **Figure 3** test is treated with both drug and RNase A. some amount of chromatin is seen but DNA fragmentation also is seen **Figure 4** testis sample treated with drug. Apoptotic bodies are formed. Cells are dead as aniline blue doesn't stain cytoplasm of dead cells. **Figure 6** testis control sample kept in deep freezer in PBS only. Osmotic shrinkage and hypoosmotic effects are seen.

Metosartan drug treatment resulted in Apoptosis in testis of rats which is Clear from the figure 4, and formation of apoptotic bodies and Degradation of chromatin is also seen. The drug Is actually involved in blocking of Beta receptors which involves in Contraction and stimulation of heart thus lowering blood pressure and here, it clearly causes apoptosis in testis. The treatment of testis in PBS alone at -20°C lead to development of cold shock in the tissue and disruption of structure of chromatin leading to osmotic imbalance which is clear from figure 5.

DISCUSSION

Cell is a highly organized structure Whose one of the function is to accommodate the highly folded chromatin in the limited space. Certain conditions lead to decision of cells between wanted and unwanted. The results are so convincing that treatment with metosartan resulted in considerable apoptosis compared to RNase A alone. But treatment with RNase A and drug resulted in protection of apoptotic conditions due to breakdown of RNAs that is involved in synthesis of apoptotic proteins and also repair of degraded chromatin. One of the main reason for the collapsed chromatin is apoptosis.

References

1. Victoria Iglesias-Guimaraes., Estel Gil-Casanelles María Sánchez-Osuna., Elisenda Mercè García-Belinchón Joan X., Comella and Victor J., Yuste Chromatin Collapse during Caspase-dependent Apoptotic Cell Death Requires DNA Fragmentation Factor, kDa Subunit-/Caspase activated Deoxyribonuclease - mediated 3'-OH Single-strand.DNA Breaks *J Biol Chem.*2013 Mar 29;288(13):9200-15
2. Maya N. Mascarenhas., Seth R. Flaxman., Ties Boerma., Sheryl Vanderpoel., Gretchen A. Stevens., (2012) National, Regional, and Global Trends in Infertility Guiñon, Prevalence Since 1990: A Systematic Analysis of 277 Health Surveys **PLOS Medicine* Dec
3. Derek D. C. Ireland., Stephen A. Stohlman., David R. Hinton., Parul Kapil., Robert H. Silverman., Roscoe A. Atkinson Jean Louis Dacheux., Matti Poutanen Victor J. Yuste., (2013) RNase L Mediated Protection from Virus Induced Demyelination 9(12) *J Biol Chem.* Mar 29;288(13):
4. David Gillespie., Edward Schulman., Mark Rozans., Dale Haines and Kevin Cuddy, Lysate RNase protection method for soft tissues *Nucleic Acids Research*, Vol. 20, No. 20
5. W. Fewell and Jeffrey L Brodsky*. Entry into the Endoplasmic Reticulum: Protein Translocation, Folding and Quality Control Sheara *Book*
6. Fred kipper david Lloyd., (1995) The aniline blue fluorochrome specifically stains the septum of both live and fixed *Schizosaccharomyces pombe* cells *FEMS microbiology letters* volume132, issue315 october, pages21
7. Eswaribeeram., kamala katepogu., thyagarajukedam (2017) Isolation and identification of rnase a from testis through hplc and chromatofocussing. *Indo American Journal of Pharmaceutical Research* 2017: 7(03).
