THE DISCUSSION SECTION

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IMRAD

- The 'Discussion' is
- the "D" portion of the IMRAD Acronym – the final part of the substantive manuscript

The Discussion

- The **Discussion** is meant to highlight the following:
- **Significance of the Results:**
- **Implications of the Findings**: The implications (future effects, possible/useful applications of the findings) based on the results of the study
- **Conclusions**: The main facts that may be inferred from the findings. The conclusions must have a clear link to the findings of the study

Components of Discussion

- The Main Finding(s)
- Strengths and Weaknesses of the Study Design
- The Significance and Implications of the Findings
- Citation of Relevant References
- Limitations Encountered
- Conclusions

Forms of the Discussion

- **Non-Structured (Narrative) Discussion**
- **Structured Discussion**

Non-Structured (Narrative) Discussion

Continuous narrative divided into paragraphs, sometimes with sub-headings

- **This format is the commonest and adopted by most biomedical journals**

The Structured Discussion

- The elements listed in the building blocks are presented under specific sub-headings
- The sub-headings used vary from journal to journal

Sections of the Discussion

- **Statement of the principal findings**
- **Description of the strengths and weaknesses of the study design**
- **Comparison of the findings with those of other studies (including the relative strengths and weaknesses of the methods used in the studies cited compared to the findings being discussed)**

Sections of the Discussion (2)

Implication of the study and how it relates to investigators, policymakers and society.

- Unanswered questions and how they inform future research

- Conclusions

The Main Findings

- The Discussion should start with a clear statement of the Main Findings of the Study (*Introductory*)

- Based purely on the results that had been presented

- Not a repetition of the Results, but a statement of the Main Inference(s) from the results

Example of opening of Discussion

Chemico-Biological Interactions 263 (2017) 88–98

Contents lists available at ScienceDirect

Chemico-Biological Interactions

journal homepage: www.elsevier.com/locate/chembioint

Chemoprotective role of quercetin in manganese-induced toxicity along the brain-pituitary-testicular axis in rats

Isaac A. Adedara*, Temitayo I. Subair, Valerie C. Ego, Oluwasetemi Oyediran, Ebenezer O. Farombi

manganese-treated rats

Fig. 7 shows the modulatory effects of quercetin co-treatment on sperm functional parameters namely sperm count, viability,

negative feedback mechanism [44]. Although excessive exposure to manganese has been shown to induce deleterious effects on the male reproductive function, the underling mechanism is yet to be fully elucidated. The novelty of the present study is the demonstration that manganese exposure affected all related hypothalamus–pituitary–testicular axis regulation and that dietary antioxidant quercetin effectively modulated the deleterious effects of manganese in rats.

4. Discussion

The mammalian male reproductive function is well-known to be regulated by the hypothalamus–pituitary–testicular axis through a

cellular components containing polyunsaturated fatty acid residues to produce peroxyl radicals, which subsequently undergo cyclization reaction to endoperoxides leading to formation of trans-4-hydroxy-2-nonenal and MDA [16]. Our data showed that caspase-3 activity which is a well-known downstream key apoptotic initiator was also activated along with the induction of oxidative stress in the brain, testes and epididymis of manganese-treated rats. The significant reversal in the manganese-mediated increase in MDA

Strengths and Weaknesses

- To Determine the kind of Weight that
- can be Given to the Evidence
- To Assess how Widely Applicable the
- Findings are to Real Life Situations
- An expression of the Authors' Honesty
- about the Limitations of their Efforts and
- their Methods

Comparison With Findings of Similar Previous Studies

- Compare your findings to those of other workers on the ***same*** subject
- Suggest possible reasons for the similarities or differences including
- peculiarities of methods or nature of populations
- Important not to show selection bias in the literature cited

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Implication of the Study

- **Meaning of the Study**

- Highlights the significance and the implications of the findings
- What do the findings mean for other investigators or policy makers?
- How will the findings impact on the community in general?

Unanswered Questions

- Have new questions been raised about the nature of diseases or patient care by your study
- How can the study be further extended to shed more light on the issue?
- Are there specific areas you would wish other researchers to take up in order to expand the frontiers of knowledge?

ELSEVIER

Food Chemistry 64 (1999) 315–321

Food Chemistry

Antioxidant activity of palm oil carotenes in organic solution: effects of structure and chemical reactivity

E. Olatunde Farombi*, George Britton

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(Figs. 3 and 6). This is in consonance with previous findings (Lim et al., 1992; Terao, 1989). All the carotenoids exhibited reactivity towards peroxyl radicals in solution. The hydrocarbon carotenes (α- and β-carotenes) are more reactive in this system than the xanthophylls (lutein and zeaxanthin). Lutein and zeaxanthin are more polar than α and β-carotenes and may possibly not react in a non-polar solvent like hexane due to the presence of hydroxyl groups. In studies on the reactivity of lutein with free radicals in organic solution, it was observed

The present investigation has demonstrated that α-carotene could possibly be a better antioxidant than β-carotene in peroxyl radical-dependent lipid peroxidation. Further studies are necessary to elucidate the effectiveness of α-carotene as an antioxidant, especially in membranes which are highly ordered and anisotropic in nature. This ordered environment may possibly affect free-radical-trapping antioxidants and differ from the present system where the carotenoids exist in free solution in an isotropic monomeric state.

Conclusions

- Another crucial part of the Discussion section of the manuscript
- Must have a direct relationship with the aims and objectives of the paper
- Could be drawn *ONLY* from the results of the study

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Food and Chemical Toxicology 42 (2004) 1315–1322

www.elsevier.com/locate/foodchemtox

Commonly consumed and naturally occurring dietary substances affect biomarkers of oxidative stress and DNA damage in healthy rats

E.O. Farombi [a,b], M. Hansen [a], G. Ravn-Haren [a], P. Møller [c], L.O. Dragsted [a,*]

Objectives

The specific aim of the study was to test within a single experiment (1) whether protease inhibitors can increase the level of oxidized proteins, (2) whether the biological effects previously observed for black currant juice is related to its content of sugars or vitamin C and (3) whether the hepatoprotective effects of kolaviron may be related to antioxidant effects The present investigation was, therefore, designed to investigate the influence of BBI, black currant juice and kolaviron on a wide range of biomarkers of oxidative stress, DNA damage and blood lipids in order to gain more understanding of their redox effects and safety.

Conclusion

Taken together, our results show that pro- and antioxidant treatments can influence plasma background levels of oxidative stress and antioxidant status in healthy young rats over a short period of time. Using this simple model we observed potent antioxidative effects of kolaviron and black currant juice in vivo extending previous observations. However, less favorable effects on plasma lipids were also observed after black currant treatments underlining the need for long-term studies in order to evaluate the overall effects of antioxidants on atherosclerosis and cancer.

Citing Literature in the Discussion

- It is best not to mention authors' names in the narrative, especially when using the Vancouver system of referencing. With the Harvard system, this may not be possible.
- In cases where it becomes necessary, only the surname of the principal author is mentioned and the others are referred to as 'co-workers', 'colleagues', *etc*

Citing Literature (1)

- In cases where it becomes necessary, only the surname of the principal author is mentioned and the others are referred to as '*et al*', 'co-workers', 'colleagues', *etc*

Final Hints

- The Discussion should be limited to the subject under study and based on the results obtained
- The Discussion of a study is not meant to be a repeat literature review. It is strictly limited to the study completed by the author(s).
- The Discussion in a Scientific Manuscript is itself a test of Objectivity and Balance in the Appraisal of Other Workers and Self

Final Hints (2)

- The Discussion reminds the reader about the purpose of the study and the problem or question the work is expected to illuminate
- It calls attention to the weaknesses in the study which could not have been foreseen at the design stage and what could be done further to add value to the study
- The authors make a definitive statement as to the outcome of the study in a concluding paragraph

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Arch Environ Contam Toxicol (2010) 59:166–174
DOI 10.1007/s00244-009-9443-3

Nigerian Bonny Light Crude Oil Disrupts Antioxidant Systems in Testes and Sperm of Rats

Ebenezer O. Farombi · Isaac A. Adedara · Azubike P. Ebokaiwe · Roy Teberen · Theresa Ehwerhemuepha

In summary, the present study demonstrated that exposure to BLCO altered testicular and sperm functions in rat by way of mechanisms involving oxidative stress. The biochemical results also showed that although BLCO elicited its toxic effects differentially on sperm and testes, the adverse effects were more evident in sperm than in testes. In view of the possible exposure of BLCO to humans, the results of the present study warrant appropriate human studies to provide more definitive data to determine actual human risk exposure. The characterization of reproductive toxicity of BLCO on the hypothalamo–pituitary–gonadal and thyroid axes, and whether the effect is transient or permanent in both short- and long-term exposure, is an on-going investigation in our laboratory.

Thank You
for
your attention