



Comparing Dpx with Nail Paint and Vitamin E Oil as Mounting Agent – A Comparative Study

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Abstract

Aim: To evaluate and compare the clarity intensity of DPX with transparent nail paint and vitamin E oil as mounting agents.

Objective: To evaluate the nail paint and vitamin E oil as the mounting agent.

Methods and Material: A total of 30 sections were taken from archival collection of the Department of Oral Pathology and General pathology. All the sections were mounted using Dpx, transparent nail paint and vitamin E oil. Comparison was drawn between these three mountants based on quality index.

Results: DPX, transparent nail paint and vitamin E oil were found significantly equal to that of DPX p value < 0.065 was considered as significant.

Conclusions: To conclude that, transparent nail paint and vitamin E oil are having good clearing intensity it means both are having good RI (refractive index).

Keywords: Mounting Agent; Dpx; Nail Paint and Vitamin E Oil

Introduction

Histological section which we need to examine for length of time or to be stored must be mounted because stain in the sample preparation is sensitive to particular solvent. The purpose of mounting is to physically protect the tissue for a long period of time.

The mounting medium bonds the specimen, slide and cover slip together with clear durable film. The medium is important for the image formation as it affects specimen's rendition [1]. A substance with highest refractive index, close to that of glass (ie, 1.5) would be the best mounting medium. DPX is the most commonly used mounting media. It contains a neutral plastic resin dissolved in xylene and dibutyl phthalate as a plasticiser. Although considered ideal, DPX has several drawbacks like flammability, prolonged setting time, health hazards which include its teratogenicity [2].

Hence, the aim of the study was to find whether transparent nail paint and vitamin E oil which have the advantages of easy availability and less hazardous effects, can meet the requirements of ideal mountants and be alternatives to DPX. We intend to accomplish the same by comparing physical properties, handling characteristics and histomorphological features of transparent nail paint and vitamin E oil and DPX [3].

Materials and Methods

Permanent histopathological preparation after tissue processing and staining viz

- 1) Staining
- 2) Paraffin Embedding
- 3) Sectioning
- 4) Clearing
- 5) Mounting

Materials used DPX, transparent nail paint and vitamin E oil as the mounting.

30 sections taken from 10 blocks of oral squamous cell carcinoma cases, from one block 3 sections taken and stained with hematoxylin and Eosin [4].

There are 3 groups.

- a. 10 slides were mounted with DPX.
- b. 10 slides were mounted with transparent nail paint.
- c. And 10 were mounted with vitamin E oil.
- d. There two observer to grades the slides.

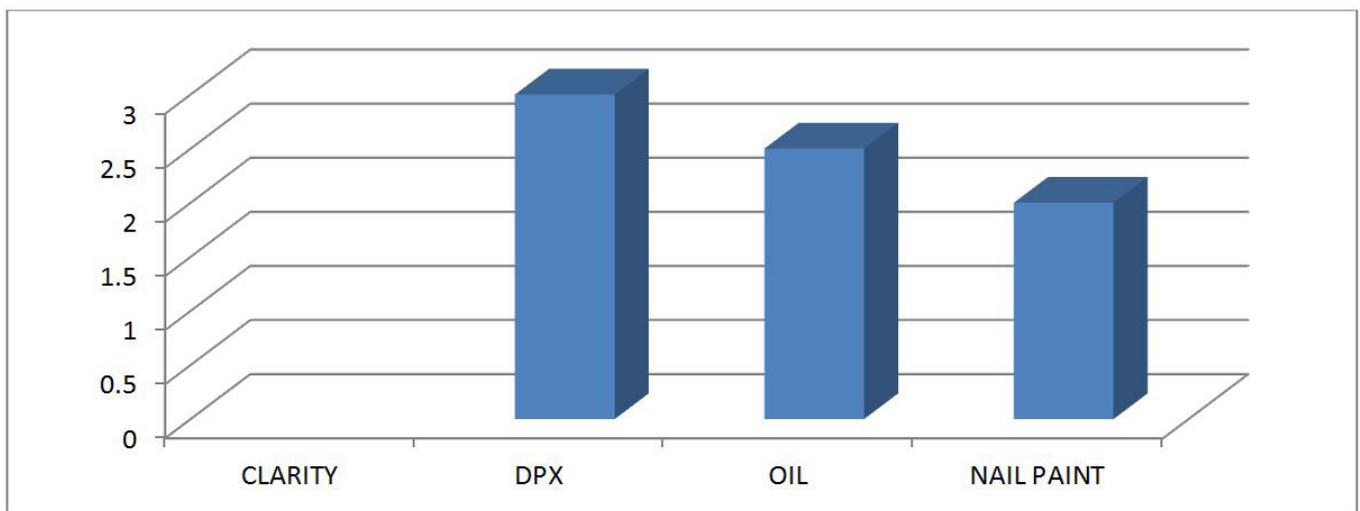
Physical properties of transparent nail paint and vitamin E oil were compared with that of DPX. The ideal physical properties of mounting media were taken as standard for this purpose. Physical properties considered were, transparency, viscosity, refractive index (R.I) and toxicity [5].

Result

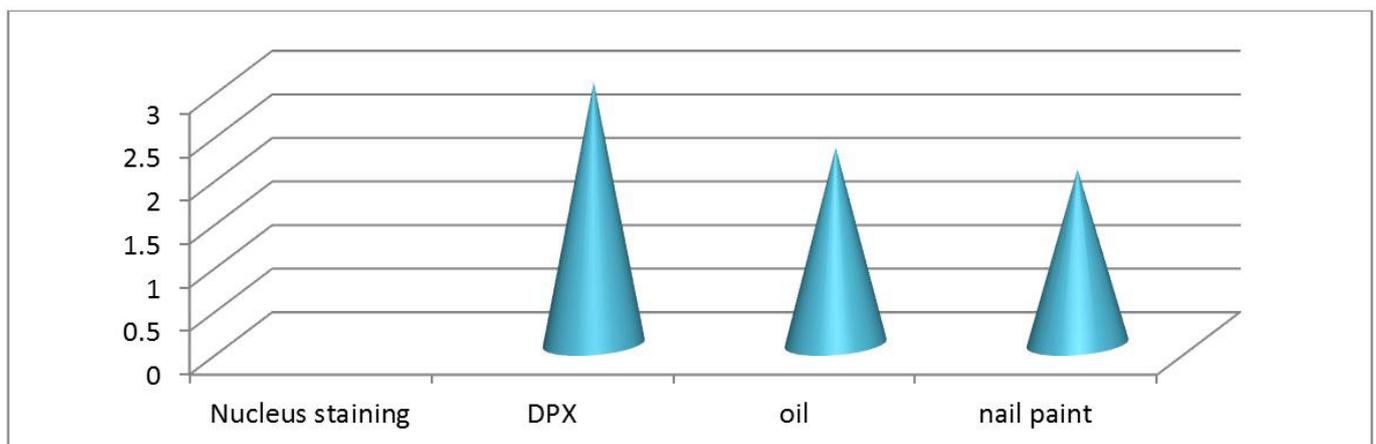
Statically significant similarities were seen between the three groups in terms of clarity cellular structures, nuclear staining, cytoplasm staining .P value of this study is $P < 0.065$

MOUNTANT	N (sample)	Mean	Standard deviation	Median	Min	Max	P value
DPX	10	12.00	0.00	12.00	12	12	0.065
Transparent nail paint	10	10.5	0.823	10.8	10.5	0.065	
Vitamin E oil	10	11.3	0.654	11.7	11.5	12	

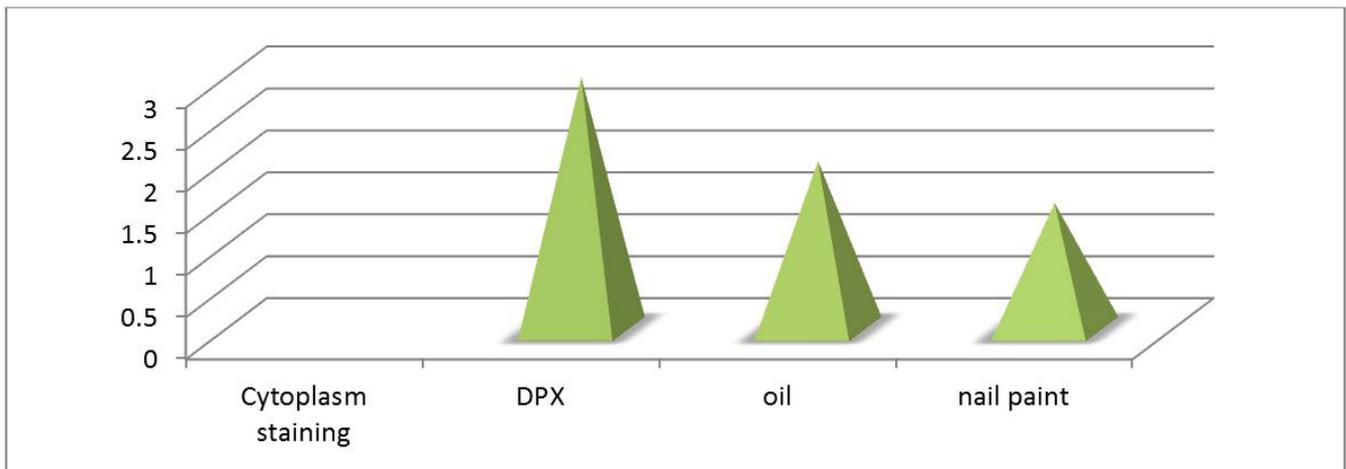
Table 1: Shows Descriptive statistics for DPX, transparent nail paint and vitamin E oil



GRAPH 1: Graphical representation of clarity of cellular structure using DPX/oil/nail paint
1= FAIR, 2= GOOD, 3= VERY GOOD



GRAPH 2: Graphical representation of cytoplasm staining using DPX/oil/nail paint
1= FAIR, 2= GOOD 3= VERY GOOD



GRAPH 3: Graphical representation of cytoplasm staining using DPX/oil/nail paint
1=FAIR, 2=GOOD 3= VERY GOOD

Discussion

Mountant is a substance, usually resinous, used for mounting a cover slip on histologic suspensions. The purpose of mounting is for long term preservation of slides and to maintain a high refractive index necessary for microscopic analysis. Basically mounting media are classified into aqueous and resinous. Dpx is the most commonly used resinous media with several advantages [6]. There are several natural mountants such as glycerine and also many recipes available to make own mounting medium. The natural ones may be cheaper than commercial products, but shows variable refractive indices. Choosing a right mounting media involves certain factors to be considered, such as, toxicity, refractive index (RI), compatibility with specimen, pigment stability, shrinkage, durability, cost and ease of use.

Mounting media should ideally have a refractive index (RI) as close as possible to that of the fixed protein (tissue) (approximately 1.53). As light passes from one medium to another, it changes speed and bends. An example of this is the apparent bending of a stick when placed in water. Light travels fastest in a vacuum and in all other media light travels more slowly. The RI of a medium is the ratio of the speed of light in a vacuum to the speed of light in the medium [7].

1. RI should be as close as possible to that of glass, i.e., 1.5.
2. It should be colorless and transparent.
3. It should not cause stain to diffuse or fade.
4. It should be dry to a non-stick consistency and harden relatively quickly.
5. It should not shrink back from the edge of cover-glass.
6. It should be able to completely permeate and fill tissue interstices.
7. It should have no adverse effect on tissue components.
8. It should be resistant to contamination (particularly microorganism growth).
9. It should protect the section from physical damage and chemical activity (oxidation and changes in pH).
10. It should be completely miscible with dehydrant or clearing agent.
11. It should set without crystallizing, cracking or shrinking (or otherwise deform the material being mounted) and not react with, leach or induce fading in stains and reaction products (including those from enzyme histochemical, hybridization, and immunohistochemical procedures).
12. Finally, once set, the mountant should remain stable.

Transparent nail paint has very good adhesive property with refractive index 1.0 lesser than the DPX but it can't be remount as we can do in DPX, and vitamin E oil has good RI more than the DPX has RI 1.54 provide good clarity, but Vitamin E oil has poor adhesive property, so we cannot be stored over a long period of time [8].

Graph 1 represent the clarity of cellular structures in all three material used in this study DPX/oil/nail paint. They score as 1=FAIR, 2=GOOD, 3=VERY GOOD, it's shows DPX has highest score for cellular clarity among the oil and nail paint, even a vitamin E oil also score good, and nail paint score has good, and there is slight variation in an vitamin E oil and nail paint score [9].

Graph 2 represent the nuclear staining and they also score as 1=FAIR, 2=GOOD, 3=VERY GOOD, it's shows DPX has highest score for cytoplasm staining among the oil and nail paint, even a vitamin E oil and nail paint has same good.

There is no variation seen in oil and nail paint [10].

Graph 3 represent the cytoplasm staining and they also score as 1=FAIR, 2=GOOD,3=VERY GOOD , it's shows DPX has highest score for cytoplasm staining among the oil and nail paint, Vitamin E oil score good and nail paint score nearly good, but lesser than the vitamin E oil [11].

In this study, both nail paint and vitamin E oil does not interfere in the cell morphology, they maintain all cell architecture features. So that nail paint and vitamin E oil can be used as alternative of DPX as mounting agent.

Conclusion

To conclude that ,transparent nail paint and vitamin E oil are having good clearing intensity it means both are having good RI(refractive index) both does not affect the architectural feature of cells, But oil mountant slide we can't preserve long period of time ,transparent nail paint and vitamin E oil has good refractive index almost equal to DPX.

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