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Comparative Assessment of some Physicochemical Properties of Marketed Infants Massages Oils

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ABSTRACT

Oil massage advantageous to the newborn are those related to the oil application and those related to tactile kinesthetic stimulation due to the massage. Topical oil use has been shown to improve the skin barrier function, thermoregulation and also shows to have a positive effect on growth. Present work was conducted to standardize the selected five marketed infant massage oils for their physicochemical parameters, i.e. color, odor, pH, specific gravity, acid value, peroxide value & saponification value. The findings of the study showed that the infant massage oils were complies the requirements for physicochemical parameters as prescribed in standard text.

Key words: Infants massage oil, physicochemical parameters, acid value, peroxide value, saponification value.

1. INTRODUCTION

The practice of infant massage by oil is not a new phenomenon. It is a part of nature-at birth, mammals massage their newborns by licking and grooming them to promote their body systems to normalize.¹ In humans, midwives ‘massage’ newborns through drying to stimulate a response to take their first breath.

More recent research shows that the practice of infant massage by oil provides benefits for both mother and baby. The popularity and demand for infant massage resulted in the establishment of the International Association of Infant Massage (IAIM) in 1986, whose membership spans more than 40 countries.²

Human skin is the largest organ of the body and protects its internal components (bones, muscles, ligaments, blood vessels and internal organs) from injury.³ The skin has three layers: the epidermis; the dermis; and the hypodermis. The epidermis is the first point of contact for the application of topical products.

The stratum corneum is the outermost layer of the epidermis (the visible part of the skin). Its main function is to act as a barrier to penetration by external irritants and to protect against excessive water loss. Skin barrier function can be affected by genetic and environmental factors. Examples of the latter include water quality, pollution, detergents and the application of skin care products.

Infant skin is more vulnerable than adult skin because it is different in several ways. For example, the stratum corneum is 30% thinner in neonates and the epidermis is 20% thinner.⁴ This puts infants at a greater risk of permeability and dryness than adults. In addition, the neonatal body surface to body weight ratio is greater than in adults, and infant skin has a greater absorption rate than that of adults. The consequence of this difference is an increased vulnerability to the effects of topical treatments.⁴

Dry skin is common in the first few months of a baby's life. The recommendation to new parents to use topical oils for the prevention or treatment of neonatal dry skin has become traditional practice.⁵

The procedure of the massage by the mother or the care giver with oils have been well-studied with the mothers doing a better job while using oils such as coconut oil and safflower oil causing better weight gain.⁶

The transcutaneous absorption of oil also increases the level of triglycerides. Increased vagal activity, is thought to help in the weight gain.^{7,8} Vagal activities, gastric motility, insulin-like growth factor levels as a result of moderate pressure massage have a role in the weight gain.⁸

2. MATERIALS AND METHODS

The skin of infants is soft and delicate in respect to adults. The physicochemical parameters study for massage oil was greatly affect the property of oil because it may contain rancidity or high irritation coefficient value which may be responsible for irritation and damage to skin of infants. Therefore evaluation of physicochemical parameters of massage oil is necessary.

Different brands of infant massage oil JM (Johnsohn baby massage oil), LM (Olive oil), DM (Dabur Lal tail), HM (Himalaya baby massage oil) & PM (Patanjali Massage oil) are purchased from local market of Ujjain. Physicochemical parameters evaluation was done using usual method.^{9,10}

2.1 Physicochemical analysis

2.1.1 Determination of colour and odour of massage oils

Color and odor of the massage oils samples were typical of their constituents.

2.1.2 Determination of specific gravity

The specific gravity of the oils was calculated from the following relationship.

$$\text{Specific Gravity at } 30^{\circ}\text{C} = \frac{A-B}{C-B}$$

Where, A = weight of specific gravity bottle with oil at 30°C (g); B = weight of specific gravity bottle at 30°C (g); C = weight of specific gravity bottle with water at 30°C (g).

2.1.3 Determination of pH

The digital pH meter was used for pH determination.

2.1.4 Determination of acid value

$$\text{Acid value} = \frac{5.61V N}{W}$$

Where, V = standard sodium hydroxide Volume used (ml); N = Normality of the sodium hydroxide solution; W = Weight of the sample (g).

2.1.5 Determination of peroxide value

$$\text{Peroxide value} = 10 \frac{(a-b)}{w}$$

Where, a = NaOH in ml required to neutralize the substance, b = NaOH in ml required for blank, w = weight of sample in (g).

2.1.6 Determination of saponification value

$$\text{Saponification value} = \frac{28.05 (B-S)}{W}$$

Where, S = KOH in ml required to neutralize the substance; B= ml of KOH required for blank; and; W = Weight of the sample taken for the test (g).

3. RESULTS AND DISCUSSION

In present work physicochemical evaluation of five marketed infant massage oils was carried out. The various standard tests were performed and their following results were shown in table-1.

Color and odor of the oil samples were typical of their constituents. The density of all marketed infant massage oils were found to be in range 0.89±0.02-0.92±0.06. The pH of all infant massage oils were found in range 5.6-5.9 near about slightly acidic, which was in accordance with human skin. Acid value is a sign of rancid state. Lower the acid value higher the quality of oil. Acid value of all the oils was found to be ranging from 0.622±0.004-0.664±0.003. Whereas peroxide value was found to be ranging from 3.43±0.12-3.66±0.14. If Peroxide value is high, the skin irritation coefficient will consequently increase and therefore many fragrances and essential oils have a peroxides index lower than a certain value. Saponification values are highly significant in the making of soap. If the value of saponification is as too high and the soap might contain too much alkali even though there is sufficient soapiness that it would react with skin & if the value of saponification was too low the fatty acid salts will not be adequate to remove or saponify the fat or oil i.e. less soapiness. Saponification value was found in range 181±0.03-186±0.05.

4. CONCLUSION

Massage oil use for infants from ancient time in India. Human skin is the largest organ of the body and protects its internal components like bones, muscles, ligaments, blood vessels and internal organs etc. from injury. The skin has three layers: the

Table 1. Physicochemical parameters of different marketed infants massage oils

S. No.	Parameters	JM	LM	DM	HM	PM
1	Acid Value	0.664±0.003	0.622±0.004	0.635±0.006	0.657±0.002	0.651±0.005
2	Saponification Value	183±0.04	184±0.05	181±0.03	184±0.04	186±0.05
3	Peroxide Value	3.58±0.15	3.54±0.16	3.43±0.12	3.49±0.16	3.66±0.14
4	Specific gravity	0.89±0.02	0.91±0.05	0.90±0.03	0.92±0.06	0.90±0.02
5	pH	5.6	5.7	5.9	5.6	5.8
6	Colour	Transparent	Pale brown	Red	Pale brown	Pale brown

epidermis; the dermis; and the hypodermis. The epidermis is the first point of contact for the application of topical products. This evaluation studies on different brand of infant massage oil suggest that, selected parameters may be used in the standardization of infant massage oils. The findings of the study show that the test infant massage oil contains low acid values which show less chance of rancidity and saponification values shows massage oil contain sufficient soapiness. Peroxide index lower than certain value means skin irritation coefficients are low. The study shows that the massage oil complies the requirements for physicochemical parameters prescribed by standard text.

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