

MERCURY IDENTIFICATION IN FACIAL WHITENING CREAMS SOLD IN CENGKARENG MARKET WEST JAKARTA

Apriani dan Steffi Indah

Departement of Medical Laboratory Technology Institute of Health Science
Kesetiakawanan Sosial Indonesia Jakarta, Indonesia
Email: aapriani1504@gmail.com dan steffiindah7@gmail.com

Abstract

Face whitening creams are cosmetics that are often used by women. Bleach creams contain active ingredients such as hydroquinone and steroids which can provide a whiter skin color while inhibiting pigmentation. This study aims to identify the mercury content in several whitening cream cosmetics circulating in the Cengkareng market in West Jakarta. The research will be carried out qualitatively the mercury color test using the color change method using KI reagent. Based on the results of the research conducted, it can be concluded that the analyst qualitatively, from 25 samples of whitening cream, there were 14 (56%) samples of face whitening cream containing mercury and 11 (44%) samples of face whitening cream that did not contain mercury. Still the presence of facial whitening creams that contain mercury, provides useful information for the public to be more careful in choosing cosmetics

Keywords: *face whitening cream, mercury, mercury color test*

Introduction

Face whitening creams are cosmetics that are most often used by women. Bleach creams contain active ingredients such as hydroquinone and steroids which can provide whiter skin color while inhibiting pigmentation (Rademaker & Lamb, 2002). In the classification of cosmetics, facial creams are included in skin care cosmetics (skin-care cosmetics) which have the purpose of moisturizing and protecting the skin from the sun. But not for diagnosis, treatment and prevention of disease (Tranggono, 2007). The results of observations conducted in the United States illustrate that more than 85% of teenage girls use cosmetics because they feel that they will make them more beautiful and confident. Skin problems are important because around 40% of Asian women have problems with facial skin spots and use facial whitening creams (Adams et al., 1985). According to Dr. Retno I.S Tranggono, Sp. KK mercury is recommended as a skin

whitening ingredient because it has the potential as a reducing agent (bleach) of skin color with a very strong whitening power to the skin. Mercury ions are thought to inhibit the synthesis of melamine skin pigments in melanocyte cells (Sembel, 2015).

Most people use whitening creams without the community generally using cosmetic products without knowing in advance the content and side effects of the products used. People tend to see the effect that can quickly provide results such as whitening the skin. Therefore, certain elements make a cosmetic ingredient that contains ingredients that have a toxic effect when used in the long term such as mercury. The results of BPOM supervision from 2005-2008 were found to be unregistered cosmetics and tended to increase from 2005-2008 respectively, namely; 45, 65, 88 and 178 types (BPOM, 2007) Research conducted by (Parengkuan, Fatimawali, & Citraningtyas, 2013) in the city of Manado from 10 test samples contained 5 samples containing mercury. The research conducted at the Hafsah Midwifery Academy in Medan showed that 74 students obtained 36.49% said they had used face whitening cosmetics even though the cosmetics used did not have permission from BPOM, 35.14% said they had used one of the cosmetics containing mercury (Hg), and 32.43% stated that BPOM had never used cosmetics, and 55.41% of respondents bought products at unofficial cosmetic sales establishments (Setiyawati, Blashki, Wraith, Colucci, & Minas, 2014)

One of the biggest traditional markets in Jakarta area that is close to the residential area is Cengkareng market in West Jakarta. In the market, many types of face whitening creams are sold. Generally women are often tempted by cosmetics that are sold at low prices without knowing the bleach cream used is dangerous. Based on the description above, this study aims to identify the mercury content in several whitening cream cosmetics circulating in the Cengkareng market in West Jakarta. The sample used in this study is whitening cream with the criteria of the type of whitening cream that has a BPOM registration number, has batch information and whitening cream that does not have a BPOM registration number and does not have batch information. , With the inclusion criteria of this study sample, among others, the products circulating in the market in Cengkareng, West Jakarta, are sought after by people at affordable prices.

Method

1. Research design

This research used descriptive analytic, which aimed to determine whether there is a metal content of mercury in face whitening creams.

2. Population and sample research

Population of the research was face whitening creams that are thought contain mercury sold in the market of Cengkareng, West Jakarta. The sample selection was done by purposive sampling, where the sampling is done according to the criteria of the researcher. The inclusion criteria in this study (1) Cream labeled whitening cream. (2) Does not include BPOM labels and POM numbers (3) Does not include the batch number (4) Does not include composition.

3. Materials and research tools

The tools used in this study were electric balance, beaker, erlenmeyer flask, volumetric flask, pipette volume, stirring rod, funnel, electric bath and filter paper. Materials used in this study were nitric acid, hydrochloric acid, potassium iodide, aquades, and samples of whitening creams.

4. Collection / research stage

a. Making Solution KI 0.5 N

Potassium Iodide was taken as much as 2,076 grams, then put in a 25 mL volumetric flask and put in an aquadest until the mark was 25 mL, and shaken until homogeneous.

b. Making Aqua Regia Solution

Concentrated HCl was taken as much as 75 mL, then put in a 100 mL volumetric flask and included with concentrated HNO₃ as much as 25 mL (volume ratio 3: 1).

c. Making a Test Solution by Wet Digestion

Weighed as much as 2 g of sample, input water as much as 25 mL, then add 10 mL of aqua regia solution, then apply until almost dry. In the remaining evaporation add 10 mL of aquadest. Then heated briefly, cooled and filtered.

d. Testing Samples with Color Reactions

5 mL of the test solution were added 1-2 drops of 0.5 N Potassium Iodide solution slowly through the test tube wall. If a positive sample contains mercury,

red orange deposits will form and the sample will be tested with 3 repetitions (Parengkuan et al., 2013).

5. Data analysis

Data was carried out descriptively accompanied by tables, discussions and tests carried out 3 repetitions with 1 positive control, and concluded whether facial whitening creams sold in the Cengkareng market in West Jakarta contained mercury. Then the results are presented in percentage numbers

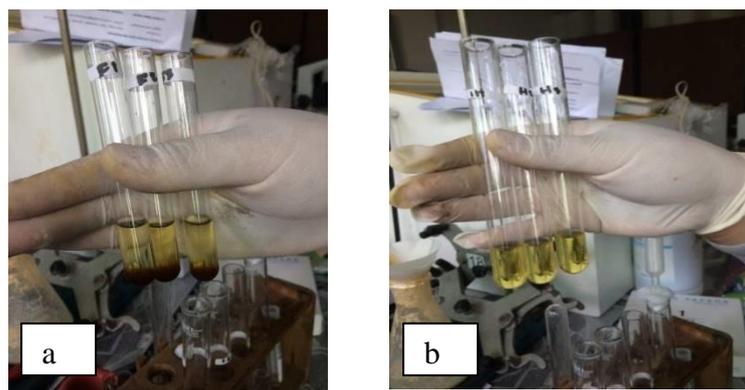
Intpretation of the Research

The number of whitening creams collected in this study were 25 samples, which came from 10 stores. From a number of samples there were 14 samples (56%) (Table 1) which showed positive. The positive results on the identification of the results of reagents KI 0.5 N are characterized by the formation of orange red deposits (Picture 1a), while the results that show negatively do not form orange red deposits (Picture 1b).

Table 1 Percentage of results of identification of mercury content in whitening creams

Check result	n	%
Positive	14	56
Negative	11	46
Total	25	100

Samples that showed positive results in this study are indicated by the formation of red deposits in solution. In this study, the samples were tested using a wet digestion method, this is due to the fact that toxic heavy metals generally cannot withstand high heat (Rohaya, Ibrahim, & Jamaluddin, 2017). The addition of aqua regia solution is intended to be able to break down organic metal bonds into Hg^{2+} , the mixture in aqua regia solution is HCl and HNO_3 , both of which are strong acids that are corrosive and capable of producing massive metals such as iron and steel. The use of HCl compounds aims because HCl is a strong acid that can clean the iron oxide crust. while HNO_3 is a strong oxidizer used for calcium and magnesium mineral crust that attaches to metals. The formation of red deposits in positive results in this study as a result of the reaction between HCl and metals in the sample solution.



Picture 1 Results of identification of mercury content. a) positive results containing mercury, b) negative results containing mercury

Based on the information contained in the whitening cream packaging that was identified, it was found that the majority of the cream samples showed positive identification results which was not included in the composition, BPOM label and batch number. However, there is 1 sample that does not exist. BOPM and No. Batch is known to have a negative result. There were 7 (28%) samples which included the composition on the packaging and 18 samples (72%) did not include the composition on the packaging (Table 2).

Table 2 Percentage of packaging characteristics that do not include the composition on the packaging

Characteristics of packaging	n	%
Include composition	7	28
Does not include composition	18	72
Total	25	100

There are 5 samples (20%) that included the BPOM label in the package, and the remaining 20 samples (80%) were not included the BPOM label in the package (Table 3). While those who included batch numbers were 5 samples (20%) and were not include batch numbers as many as 20 samples (80%) (Table 4).

Tabel 3 Percentage of packaging characteristics that do not include the BPOM label on the package

Characteristics of packaging	n	%
Labeling BPOM	5	20
Not labeling BPOM	20	80
Total	25	100

Tabel 4 Percentage of packaging characteristics that do not include batch numbers

Karakteristik kemasan	Jumlah	%
include batch	5	20
Not include batch number	20	80
Total	25	100

Detecting the mercury content in the face whitening cream sample indicates that this whitening cream is not safe to use as stated in the Regulation of the Minister of Health of the Republic of Indonesia No.445 / MENKES / PER / V / 1998 that there should be no added mercury ingredients in cosmetics mercury is toxic (BPOM, 2007). Preservatives and sunscreens on cosmetics and decisions of the head of the POM No.HK.00.05.4.1745 About Cosmetics that mercury and its compounds are prohibited for use in cosmetic products except phenyl mercury as a preservative for eye preparations with a concentration of 0.007% (BPOM, 2008)

Based on the results of this study, it is known that BPOM labeled creams still use mercury, and not all non-labeled BPOM creams contain mercury, but creams that have no permission from BPOM are not recommended because what substances are in in cream, it must be investigated further. For that, people should be more selective in choosing the cream used, mercury research on face whitening creams circulating in the city of Jakarta are still not many who have examined, qualitative test studies of mercury in face whitening creams carried out in the city of Bandung from 15 samples tested, samples did not showing the presence of red sediments of people and the results of all samples were negative (Budiman, 2016)

Detected samples of mercury are samples circulating in the community and sold freely in the market and in stores. This should be considered by the government in circulating various facial whitening products, because 13 (68%) of face whitening creams that are positively containing mercury are very clear that they do not have POM numbers or batch numbers, while 13 (68%) are examined, most of them Bleach cream samples do not have a composition on the packaging, but still circulating in the community.

Currently on the market, more local and foreign whitening cosmetic products are circulating, this is due to one of the effects of free trade. There are times when the foreign product in the country is not used for reasons of health and safety, but it can be

exported and entered into Indonesia such as medicinal products with high dose of antibiotic content, cosmetics with mercury for skin whitening.

The effect of using a face cream containing mercury can be felt by the user in the long term after use. The process of the emergence of these effects starts from the skin pores as the initial source of the entry of these compounds. Every pore on the skin is connected to a blood vessel. Creams that are applied to the surface of the skin of course will enter the pores, then carried into the blood vessels and eventually can cause disorders of the nervous system, kidneys, and other organs. After years of use, mercury can settle under the skin so the skin will turn blackish blue. This can lead to cancer (BPOM, 2007), and mercury will settle in the kidneys which results in kidney failure that is very severe (can cause death). In the human body inorganic mercury can form complexes with glutathione in the liver and secreted in the form of a complex of mercury-glutathione or mercury-cysteine. Apart from forming complexes with glutathione and cysteine, inorganic mercury also forms complexes with bile salts which are then secreted together with feces. But the inorganic mercury complex with bile salts in the large intestine can be absorbed back into the human body (Desriyanti, 2012).

Conclusion

There are still facial whitening creams that contain mercury that are freely sold in the market in Jakarta. Most of the facial whitening creams are not include BPOM labels and batch numbers.

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