

To investigate the awareness of the ill effects of contact with Bisphenol A on the people residing in Pune

Asst.Professor. Amar v chavan

Bharati vidyapeeth (Deemed to be) Institute of Hotel Management and Catering Technology, Pune -
33,Maharashtra,India.

Email:-chefamar9@gmail.com

Abstract: A detailed study has been done in the research paper the chemical that has been used to printed on thermal paper containing Endocrine Disruptor Bisphenol it harms to the Human Body by causing major diseases like mammary Cancer, High Blood Pressure ,Asthma

This paper tries to find out what are the major precaution has to be taken while handling thermal roll bill printed receipts.

Keywords: Endocrine Disruptor Bisphenol, Mammary Cancer Diseases.

1. INTRODUCTION

Now a days every where people is asking for the bill after purchasing any goods .The bill paper what is being used now a days its containing the Endocrine Disruptor Bisphenol

Once ingested Bisphenol is absorbed through the gastrointestinal tract and transported via the venous circulation to the liver.First its passes to the metabolism result in the induction of phase II.The subsequent conjugation of the majority of the bisphenol absorbed. Vis versa in the rodents Non human primates & human uridine disphate transferase is reported to the major metabolite of BPA.Most studies on Bisaphenol agrees that the coniugate are biologically inert and thus all affects are generally attributed to the action remaining free unconjugated BPA.There are various studied are been published on the chronicling the pharmacodynamics of BPA in rodents model.The eliminating or destroying of the BPA in these studies occurs quickly with the majority of the administered does being eliminated within 24 hours .It has been found that the adult humans were capable of cleaning a single ,orally administered bolus within 24 hours .The half life were were recorded as 5.3 hours

In the study of the BPA Animal content high concentration parental of BPA in their body .A very good example is Rat.

SIGNIFICANCE OF STUDY:-

The purpose of the study to find out the reason what are diseases occurred due to used og the thermal paper roll.

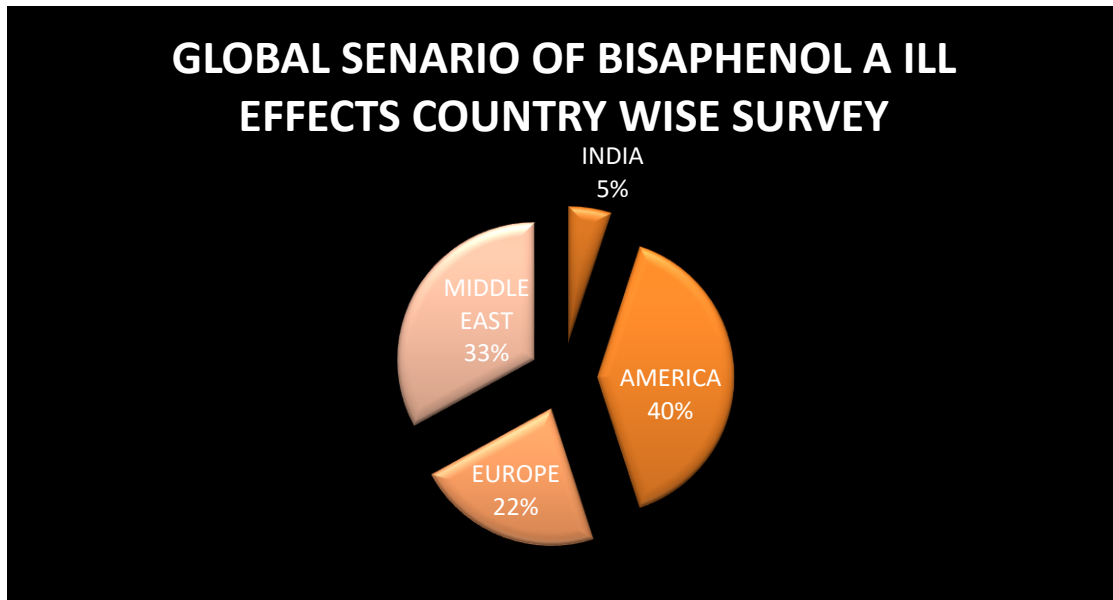
Following are the Major diseases occurred are as followed:-

1. Mamary cancer
2. As per the Fertil Steril published Research it affects on male productivity system i.e.(semen low motility) it affects on male productivity systems.
3. Urinary infection to the male (Due to contact with BPA chemical)
4. Its reduces the Insulin level in the Human Body.

2. LITERATURE REVIEW

1. GLOBAL SENARIO OF BISAPHENOL ILL EFFECTS:-

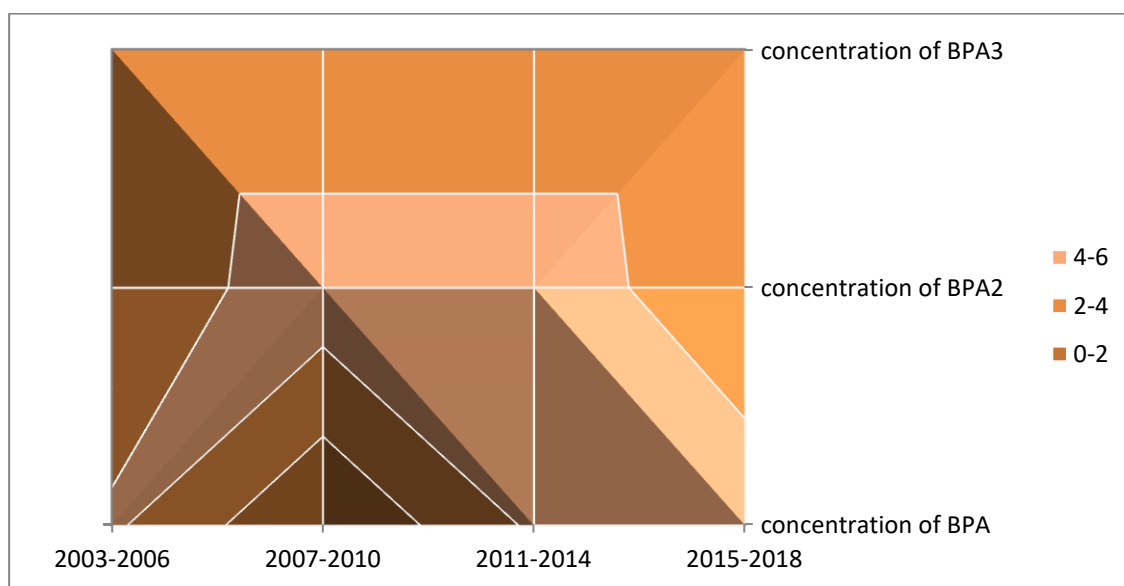
As per study of the DR .FELDMAN research the BPA Highly contained deseases are found overall globally to the AMERICA was fond the 40% deseases found in EUROPE it was founded 22% in MIDDLE EAST it was founded 33% and in INDIA it was 5% was founded by the research of the DR FELDMAN .



At first glance, the manufacture of bottles America in experienced the highest portion while Indian gained the least attention in this field. It is noticeable that 40% was the percentage that mass-produces bottles in America, compared to 22% of Europe and 33% Middle East. However India and Europe just put the modest manufacture of bottles, which was 5% and 22% respectively. In 2008, there were 22 billion food cans and 100 billion cans for soft drinks, which were produced with BPA.

With the innumerable bottles produced each year, people, and children in particularly, are easily expose to Bisphenol a contained in bottles. The number of children whose exposure to BPA had increased significantly since BPA was used widely from 1950. Furthermore, Karin B. Michels, associate professor of epidemiology at HSPH and Harvard Medical School said that drinking water from polycarbonate bottles in just one week went up urinary BPA levels more than two third, and if people heat those bottles, the levels would be higher.

2. The line graph below demonstrates the concentrations in urine samples in children.



To find out whether or not children expose to Bisphenol A, many scientists research in urine samples from all age groups, including children and adults. This data which show concentrations in urine samples are obtained from individual survey participants conducted by National Center for Health Statistics and National Center for Environmental Health, National Health and Nutrition Examination Survey. The figure for the Median and 95th percentile concentrations in urine decreased significantly. Between 2003 and 2006, the number of the median concentration of BPA in urine of children ages 6 to 17 years is 4 µg/L in comparison with 16 µg/L of 95th percentile concentration in urine. It is noticeable that the figure for 95th percentile concentrations in urine reached a peak at 17 µg/L in 2007-2010 while 2010 was the year that the Median experiences the lowest percentage, about 2 µg/L. These changes are extremely important in reducing the rate children whose exposure to Bisphenol A

DISEASE IN MODERN LIFE

Although the current trend in using Bisphenol A had declined significantly, BPA pose risk to human health. Bisphenol A was researched in several scientific reports of the independent research group over the world. According to a scenario analysis of 12 experts in the National Toxicology Program - NTP, BPA makes the reproductive system and the brain of newborn animals develop abnormally. A small dose of BPA can cause negative effects on young children. Some studies even suggest that young children are easily affected by Bisphenol A because the young body is still developing. Therefore, the immune system cannot protect and remove the dangerous chemical, especially Bisphenol A.

Generally, although eating too much or lack of exercise are the important factors that lead to obese in teenager, said Dr. De-Kun Li, Bisphenol A might also contribute to the increasing in the obesity rate. Li and his colleagues studied 1326 children aging from 9 to 12, and measured BPA levels in their urine. (Corvese, 2013). The girls who have higher BPA levels were associated with the double risk of obesity. Researchers explained that Bisphenol A is referred to as endocrine disrupting chemicals, which interfere with elimination of natural hormones in the body. These natural hormones are responsible for reproductive development, fertility and maintenance of homeostasis. Therefore, when the concentration of BPA are high in girl, Bisphenol A which acts like estrogen make a significant contribution to the early puberty and cause weight gain.

With the weakened immune system and the consequences of obesity caused by Bisphenol A, young people are more likely suffer diseases such as: high cholesterol, high blood pressure and diabetes (Ogden CL, Carroll MD, Kit BK, Flegal KM, 2011). People who become obese as early as age are more likely suffer cancer in adults including cancer of the breast, colon, kidney, pancreas, gall bladder, and prostate. (*A Cancer Journal for Clinicians*2006). In 2010, a report from The President's cancer Panel identified more than 130 studies that have linked BPA to obesity, breast cancer and other disorder problems (World-wire.com, 2010). Besides, there are many serious consequences of BPA that are proved by many scientists, such as: brain and behavior problems, heart problems and low IQ (Empen, 2013). If these diseases are not treated effectively, they have a negative impact on the development of children in the future. Therefore, eliminating Bisphenol A from the body can help young children have an excellent health without affecting by prevalence diseases in modern life

SOLUTIONS:-

Recognizing the harmful effects of Bisphenol A and considering it as a national issue, scientists and governments take this problem in serious concern.

From a scientific perspective, developing alternative to Bisphenol A is a major breakthrough in eliminating BPA from the body as well as in cancer research. Furthermore, under the pressure of people who worry about the BPA's adverse affect on human health, researchers over the world put more effort in finding the substitute for Bisphenol A. In fact, many manufactures in United States show that it is possible to replace BPA not only in baby bottles, but also in food cans and drinking bottles. They developed a chemical which originate in sugar, and this substance allow us to create a family of isosorbide-based epoxy resins that is capable of standing in for Bisphenol A, said Professor Michael Jaffe (Harrington, 2010). Besides, there are many possible substitutes to bottles and containers containing BPA, such as stainless steel, Tritan Copolyester, Polypropylene (PP), Polyethylene Terephthalate (PET), Polyamide , Polyethersulfone (PES) and oleoresin [Oregon Environmental Council, 2013; Det Økologiske Råd, 2013], all of which are environmentally friendly alternatives. In 2008, Nalgene said that they produce baby bottles with these substitutes, and it is obvious that these materials do not contain Bisphenol A.

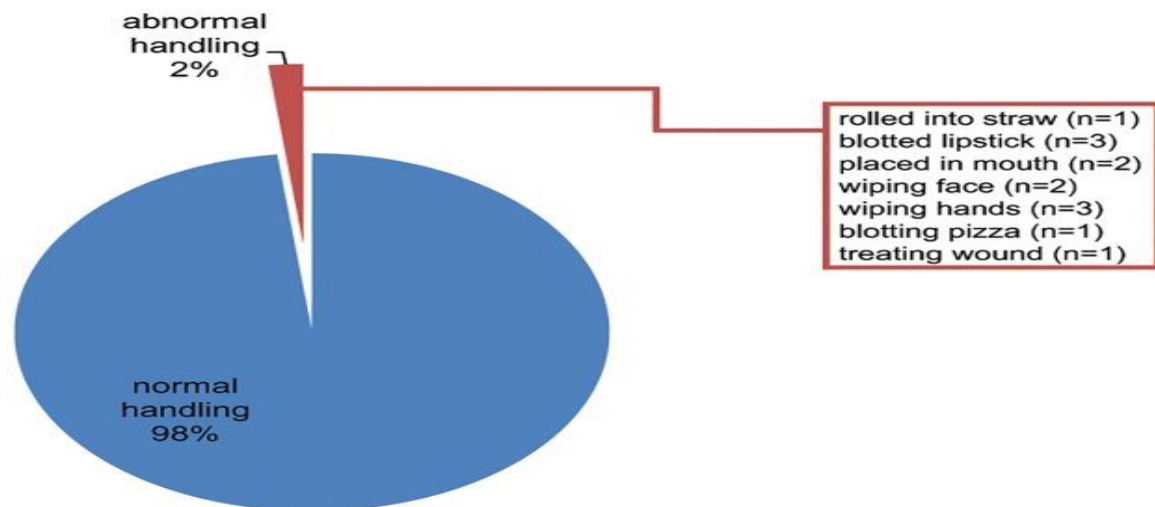
Apart from practical concerns mentioned above, it would be unfair without taking into account the contributing factor of government in wiping off Bisphenol A from baby bottles. Canada becomes the first government in the world to carry out the negative effects of Bisphenol A. In October 2010, they imposed limitations on using bottles which contain BPA. Apparently, these ban helped decrease the rate of using bottles. Not only does Canada's government ban using Bisphenol A, but also other countries legislate on the reduction of baby bottles. Washington is a good illustration for campaigning to act against BPA. According to Washington State Legislature. Besides, governments force manufactures to label each baby bottles with the contents and statistics of Bisphenol A. Hence government can manage the concentration of BPA in bottles. In addition, thanks to attaching label, individual can easily check the bottles whether or not contain BPA. If the products say "phthalate free" or "BPA-free", consumers can purchase these products without worrying the harmful effect of Bisphenol A

3. DATA ANALYSIS & FINDINGS

An unusual handling pattern was observed

Participants were also evaluated for interacting with the thermal paper unexpectedly. If individuals handle thermal paper in a way that deviates significantly from the paper's intended use, which could potentially alter their exposure to the chemicals in the thermal paper, it was considered an unusual handling pattern for people.

We had 13 individuals (2%) interact with their receipt in a way that was not expected to be used for normal consumption. Taking a receipt for a subject, it was found to be rolled into a cylinder and used as a drinking straw. Three persons used the receipt to blot the blot plastic and the other Two additional participants had their receipts in their mouths while the participants were handling objects (plates, lets, cell phones, etc.). Two participants were seen using their receipts as napkins to remove food from their faces, and the other three subjects were seen using receipts to remove food from their hands. One person used a receipt to scrape the grease off his pizza and finally one used a receipt to stop the bleeding from a small cut on his hand.

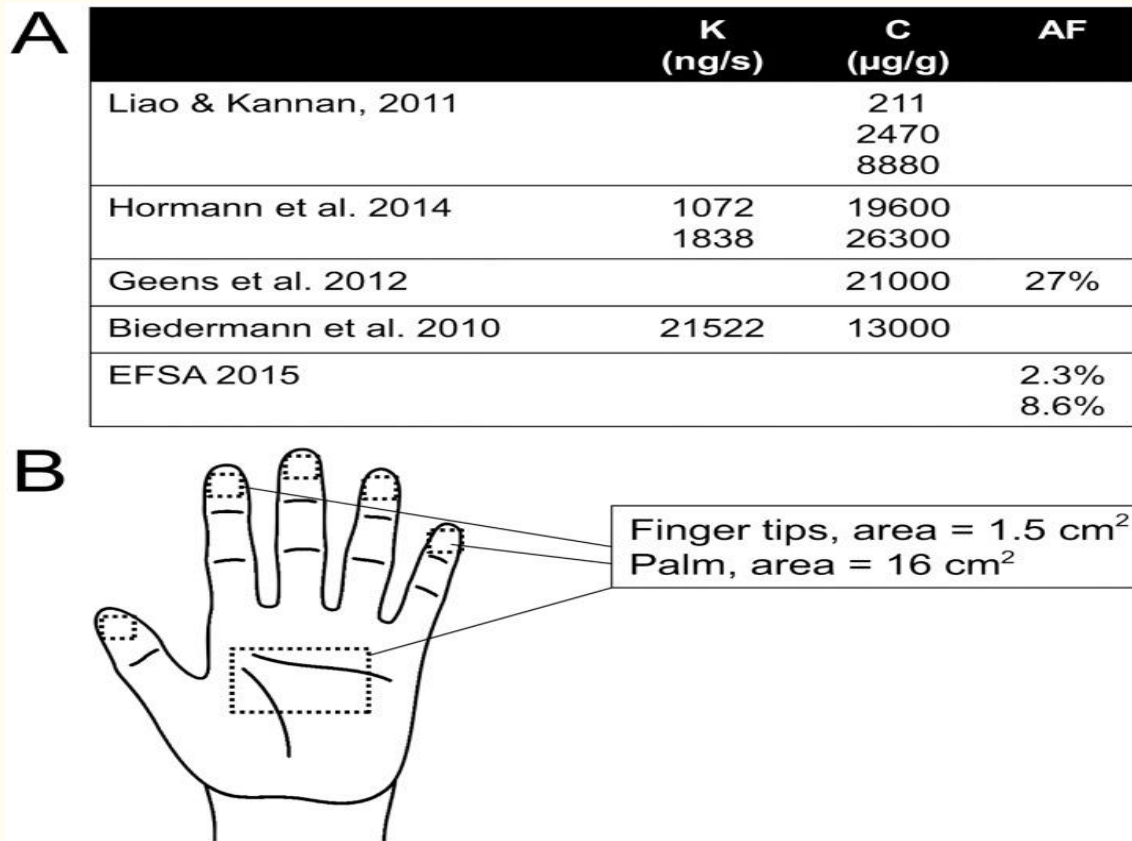


Abnormal handling parameters were observed in ~2% of study participants.

Typical handling of thermal paper involves contact of only the hands (fingertips and palm) with the paper. Atypical handling patterns were observed in 13 individuals as indicated in the figure.

Estimates of BPA intake from thermal paper handling: Influence of handling time

Liao and Kannan [24] used an equation to estimate BPA intake from thermal paper, with a number of constants and other variables that have been calculated or measured experimentally (Eq 1). Additional studies have allowed for new estimates for some of these variables (Fig 3A). To calculate plausible estimates of intake from thermal paper, we first calculated estimated intakes using the equation described in Eq 1, three different values of paper to skin transfer coefficients calculated from previous studies ($k = 1072, 1838$ or 21522 ng/s), three different values of absorption factors ($AF = 2.3, 8.6$ or 27%), and handling times measured in our observational study. Calculations were run for the lowest concentrations reported in thermal paper (0.211 mg/g) or the highest concentrations reported in thermal paper (26.3 mg/g).



EI, Estimated intake

k, paper to skin transfer coefficient [ng / s]

c, concentration of BPA in thermal paper [µg / g paper]

HF, handling frequency, assigned a value of 1

HT, handling time, measured via observations

AF, absorption factor

SF, scaling factor for surface area, measured via observations

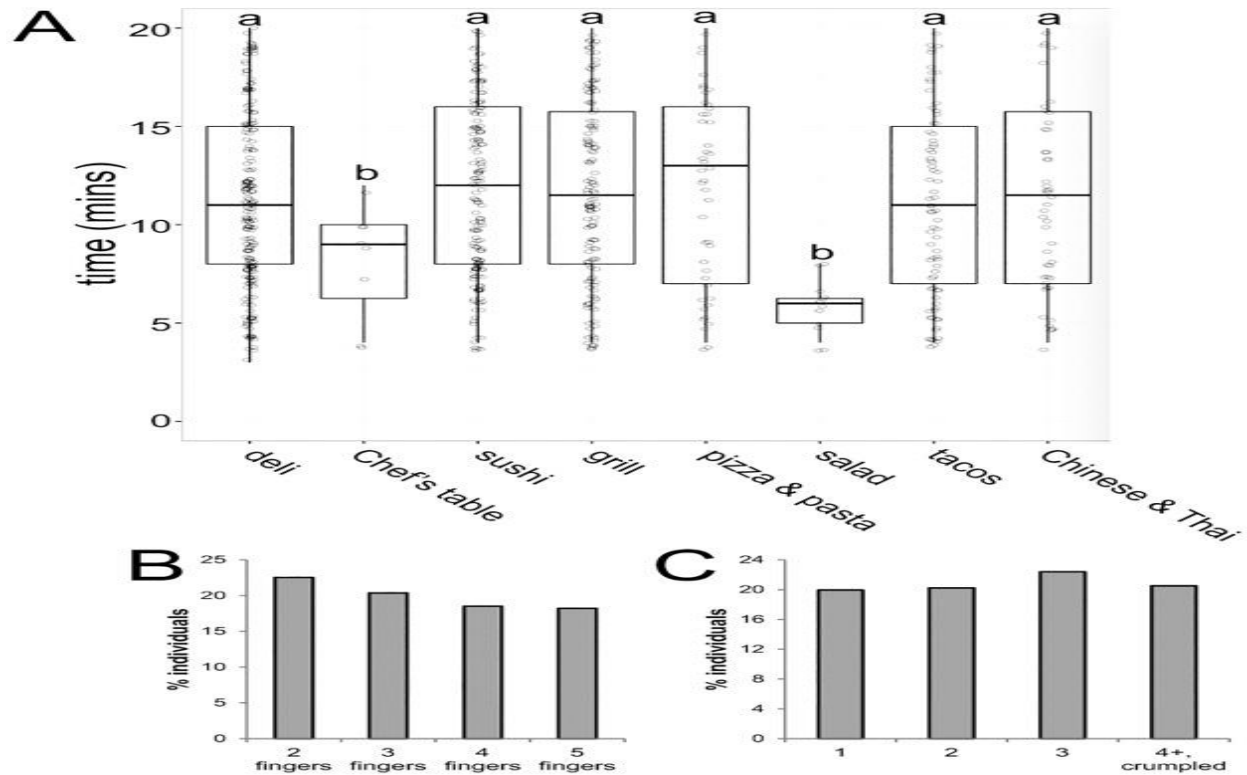
BW, body weight, assigned a value of 70 kg

4. RESULTS

Typical handling of thermal paper in short-order cafeterias

The University of Massachusetts–Amherst has a central dining facility with multiple food stations where food is produced on short order; customers in this facility typically order their food, receive a receipt, and then wait for their food to be prepared, allowing for observations of typical thermal paper handling. Observational data were collected from 698 college aged individuals purchasing food in this dining facility. Females accounted for 364 of the observed participants (52%).

Of the individuals observed, an average total contact time of 11.5 ± 0.26 min was measured. Similar average contact times were observed for females (11.6 ± 0.24 min) and males (11.3 ± 0.26 min). Some statistically significant differences were observed based on the type of food ordered; stations where food was prepared prior to the production of the receipt (e.g. the salad station) were associated with shorter handling times whereas stations where participants were typically handed a receipt followed by a wait for the food to be prepared (e.g. the sandwich station) were associated with significantly longer handling times



Characteristics of thermal paper handling by study participants.

A) In most of the dining stations, individuals handled thermal paper for 10–12 minutes. Two stations were associated with decreased handling times, the salad station and Chef's Table. Both of these stations involve preparing food prior to the acceptance of the receipt. Groups with different superscripts (letters a, b) indicate significant differences, $p < 0.05$, Bonferroni adjusted posthoc comparisons after significant 1-way ANOVA. B) Characteristics of the number of fingers individuals used to handle thermal receipts. C) Characteristics of the number of folds participants made when handling thermal receipts.

EVALUATIONS:-

As we know, nothing interesting is ever completely one-sided, these solutions that wipe Bisphenol A of baby bottles also have the pros and cons. It seems to me that the potential consequences of rules and regulations are significant than the possible dangers.

On the one hand, imposing constraints have a negative effect on the quality of products. Bisphenol A is a suitable chemical for hardening polycarbonate plastics. If government ban using Bisphenol A in baby bottles, the quality of these bottles will degrade. Furthermore, the substitute is not as good as Bisphenol A. For instance, acrylics, which stand in for Bisphenol A, are used in producing bottles. However, this substance is more brittle than Bisphenol A, and it is obvious that the bottles are easily broken.

On the other hand, I would argue that these drawbacks are outweighed by the benefits. Removing Bisphenol A will be of benefit to economy. In 2008, there were 12,404 cases of childhood obesity and 33,863 cases of coronary heart diseases that associated with Bisphenol A. By eliminating this substance from the body, we can reduce child health care expenditure, which was about \$2.98 billion. Specifically, the cost of BPA- attributable childhood obesity and coronary heart were approximately 1.5 billion and 935 million respectively (Trasande, 2014). Furthermore, if we use the substitute for Bisphenol A, it costs a fortune. Some report suggest that oleoresin, which stand in for Bisphenol A, can cost 2.2 cent more than BPA in the lining of aluminum cans. With 100 billion these cans produced each year, the cost of substitute for BPA would be 2.2 billions [LaytonL, 2010].

5. CONCLUSION

The development of Bisphenol A has gathered advantages and disadvantages. Although BPA is the crucial factor in manufacturing baby bottles, it was inevitable that there would be impact of Bisphenol A in baby bottles on children

health. The negative effects associate with prevalent diseases in modern life such as early puberty and obesity. Hence, governments and scientists take into action as soon as possible to preclude child health expenditures, which are closely related to large economic burden. In the future, it is necessary to test potential substitutes in order to prevent the use of replacement Bisphenol A that may lead the same or worse health consequences.

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