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## Editorial:

The first paper in this issue of *EJAIB* documents the experiences of four kidney recipients in Japan, exploring the impacts of receiving a life saving operation which has been considered one of the miracles of modern medicine. Michio Miyasaka and colleagues explore how people felt after receiving kidneys.

The second paper by Sumaira Khowaja-Punjwani takes up a controversial topic for any religion, that of abortion. There are various fatwa's that serve as guidance for persons faced with the bioethical dilemma of considering abortion of a fetus with genetic and physical problems.

Atok Miftachul Hudha et al. examine how teacher trainees in Indonesia are aware of bioethics, and where they receive their information about it. Although bioethics is mandated to be included in all levels of education, unless teachers are aware of bioethics it is not going to be well taught, if taught at all. Bioethics is moral reflection, not simply like teaching algebra.

Nusrat Fatema Chowdhury describes how paternalism is common in dentistry, and calls for a change from paternalistic practices to informed consent in dental practice. Dental ethics is a critical issue that everyone faces in maintaining oral health. Nila Kasuma et al explore how palatal rugae patterns can be used to determine familial lineage. This raises further issues of privacy when tracing genetic relationships.

This theme of familial relations is explored further in a legal context by R.R. Kishore for posthumous reproduction. This issue then presents some of the basic bioethics issues that global society has discussed over the past few decades. *EJAIB* hopes that these cases and explorations from different cultures will provide inspiration to generate more research to enhance our understanding of cross-cultural and global bioethics.

- Darryl Macer

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## **Anguish and distress in recipients of cadaveric kidney transplants in Japan: a study of four cases**

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### **Abstract**

In this study, we reveal the anguish and distress experienced by four recipients of cadaveric kidney transplantation (CKT) at Niigata University Hospital in the context of their life histories. The study participants had experienced the following life histories: 1) regret over worsening kidney disease and dissatisfaction with the information provided by medical staff, 2) long-term suffering from dialysis, 3) hopelessness of receiving a living kidney donation, 4) habituation to a life of dialysis and anxiety about transplantation, 5) a positive or negative impression of transplantation, and 6) consideration of the donor with constraints imposed by the anonymous transplant system. Our analysis suggests that recipients who underwent CKT experienced distress as follows: 1) waiting for CKT while undergoing dialysis was the only option that patients had not having close relatives donors; 2) their autonomy in making a choice of treatment was too limited, partly due to long-term suffering associated with dialysis. It was limited to adapting to dialysis over their entire lifetime or undergoing CKT to fully recover; and 3) CKT recipients experienced distress over concern for others and as a recipient of a precious gift that they should not waste, regardless of their postoperative condition. Moreover, the current system prohibits any contact between donors and recipients; thus, recipients are only able to express their gratitude to a nameless donor.

### **Introduction**

The number of patients with end-stage renal disease is increasing worldwide. In 2010, an estimated 2.62 million patients received renal replacement therapy, and the number is estimated to increase to 5.44 million by 2030<sup>1</sup>. Renal replacement therapy includes dialysis and kidney transplantation. Kidney transplantation comprises both cadaveric kidney transplantation (CKT) and living kidney transplantation (LKT). CKT and LKT have been performed in Japan since 1956 and 1964,

respectively. Since the 1980s, kidney transplant outcomes have dramatically improved as potent immunosuppressants have been developed and measures against postoperative infection have advanced.

In North America, Western Europe, Turkey, Iran, South Korea, and several other countries, 35 or more cases of kidney transplantation per million population were performed in 2013<sup>2</sup>. The ratio between CKT and LKT markedly varies among countries. CKT is predominant in countries such as the United States, Spain, Norway, and the United Kingdom, whereas LKT accounts for more than half of kidney transplantations in other countries including the Netherlands, Turkey, Iran, and South Korea. In Japan, 1,586 kidney transplants (12.5 cases per million) were performed in 2013; of these, 1,431 cases were LKT and 155 were CKT<sup>3</sup>. After the Japanese Act on Organ Transplantation was amended in 2009, CKT cases involving brain dead donors increased, while those involving cardiac arrest donors decreased. Although the number of LKT cases has continued to steadily increase, the overall number of CKT cases appears to have plateaued. According to a report published by the Japanese Organ Transplant Network, only 155 (1.2%) of 12,000 patients on the waiting list were able to undergo CKT in 2013<sup>4</sup>.

Although dialysis can be performed as long as the necessary facilities are available, it has disadvantages including higher cost, and patients being restrained for a long time and being restricted in their food and water intake. In contrast, kidney transplants provide a better prognosis with longer survival<sup>5</sup> at a lower cost<sup>6</sup>; thus, a transplant is usually considered a better option than dialysis. However, no clear evidence exists on whether kidney transplants provide a better quality of life to patients compared with dialysis<sup>7,8</sup>, because the evaluation of the quality of life in recipients must take psychological and social impacts into account. In Japan, while there has been a social debate whether brain death is the same as human death or not since the 1980s, the negative effects of organ transplantation have also been discussed in the context of life and death, traditional religious views, and ethical views among the Japanese. Because the number of kidney transplants has not increased in line with the number of end-stage renal disease patients, it appears that the suffering of patients with end-stage renal disease has been compounded in Japan. LKT is more likely to be performed but poses a physical risk to healthy relatives. Additionally, as CKT remains an extremely difficult option, the duration of dialysis is markedly prolonged. CKT recipients include those who had received long-term dialysis without the possibility of LKT from a

close relative and those who had previously received CKT of low feasibility. Therefore, the patients' suffering should be assessed throughout the life span. However, no previous studies have been conducted from such a standpoint. In the present study, we aimed to examine the anguish and distress experienced by CKT recipients in the context of their life histories.

## Methods

Our study participants were adult recipients of CKT at Niigata University Hospital from donors who were not the recipient's close relative, performed after January 2012. Data were collected through approximately 60-min semi-structured interviews held at Niigata University Hospital between April and June 2014. Verbatim reports were created from the participants' recorded conversations, and portions describing the evaluation and emotional expression about events were extracted, which was encoded using abstract representations. Codes extracted from the verbatim reports of all participants were then compared and integrated, and those similar in content were renamed. This study was approved by the Niigata University School of Health Sciences Research Ethics Committee (No. 108).

## Results

### *A- Background of participants:*

Of the four participants, only A was a woman. D was in his 40s; A and C were in their 60s, and B was in his 70s (Table 1). The dialysis period ranged from 13 to 20 years. D applied for CKT approximately two years after hemodialysis was initiated, while the other participants applied at the time of dialysis initiation. Other than B's household, which was a three-generation extended family, the households of the three other subjects included two members, the participant and their husband or a parent. The participants' occupation statuses were as follows: A left her job when she started dialysis, C retired at the maximum age limit, and both B and D continued to be self-employed. (See Table 1)

### *B-Pooled analysis; Shared and diversified experiences:*

The codes extracted from the life histories of the four participants were categorized into the following six categories:

#### *1) Regret over worsening kidney disease and dissatisfaction with the information provided by medical staff.*

The participants discussed the regret they felt on having kidney disease. They rarely had any subjective symptoms during the early stages of kidney disease and came to know about the deteriorated function of their kidneys only after

seeing the test results and being informed by physicians. While experiencing regret about living a thoughtless life with no sense of crisis, some participants were dissatisfied with the lack of information provided by medical institutions.

**Table 1:** Participants' background

Participant	A	B	C	D
Sex	Female	Male	Male	Male
Age	60s	70s	60s	40s
Period on dialysis	20 years	13 years	17 years	19 years
Time of registration as kidney transplant candidate	Upon dialysis initiation	Upon dialysis initiation	Upon dialysis initiation	Approximately two years after dialysis initiation
Family members living together	Husband	Wife, oldest son and his wife, three grandchildren	Adoptive father	Mother
Occupation	Unemployed (left job upon dialysis initiation)	Self-employed	Unemployed (retired at the age limit)	Self-employed

#### *2) Long-term suffering from dialysis.*

Once dialysis was initiated, painful days began without a precise endpoint. The participants shared physical suffering such as fatigue and tiredness, and suffered from restrictions in daily life, including restricted water intake and long periods of time spent on dialysis.

#### *3) Hopelessness of receiving a living kidney donation.*

Three of participants (A, B, and D) received offers of a living kidney donation from family members, but LKT was not performed. Although the specific situation of each participant was different, they all revealed mixed feelings about LKT. For A, her son offered to donate a living kidney, but A's physician did not agree to receiving LKT from a young family member. C had given up on LKT from his family because he was an adopted son.

#### *4) Habituation to a life of dialysis and anxiety about transplantation.*

When the participants received the notice for kidney transplantation, they became anxious about the surgery itself and life after the procedure and

wondered if they should undergo CKT to end the dialysis lifestyle they had endured for many years.

*5) A positive or negative impression of transplantation.*

Once the transplantation was complete, the participant's lives changed drastically. While three participants (A, B, and D) were in a good postoperative condition, the postoperative condition of the remaining participant (C) was not as good as imagined. The participants who were in good postoperative condition noticed the recovery of health status with the resumption of urination, which did not happen while on dialysis. In addition, while they felt anxious about taking a large number of medications, they gradually realized that they were on their way to recovery because they had no particular subjective symptoms.

*6) Consideration of the donor with constraints imposed by the anonymous transplantation system.*

All participants had been concerned over the feelings of the donor and his/her family and experienced complex emotions because of these considerations. These emotions included respect to the donor and compassion toward the donor's family. The transplant recipients wanted to tell their donor's family how thankful they were, but they were not allowed to directly contact them under the current system in Japan. Feelings for donors and their families were often described as pressure. This was because if the received kidney did not function, the recipient might feel as if it was his/her fault.

## **Discussion**

*1. LKT as an intersubjective choice.*

At the time of initiating dialysis, kidney disease patients in Japan face the option of LKT from close relatives. It has been reported that people who have successfully undergone LKT from family members experience a sense of guilt that they imposed a risk to their loved ones<sup>9</sup>. However, our participants did not undergo LKT from close relatives. For them, it was not a simple personal choice but rather a complex decision based on interpersonal considerations with close relatives, as illustrated by A's story. She initially accepted the offer from her son but later gave up this possibility by accepting the opposing opinion of her physician. Moreover, she made no attempt to discuss LKT with her husband. If the power structure in the family was more patriarchal, she might not be able to even expect a live organ transplantation from a man in her family. In addition, C's story illustrates that the lack of equality in receiving organ transplantation from a living donor was greatly influenced by the patient's family relationships. C had given up the

possibility of organ transplantation from a living donor because he was an adopted child.

However, even if the power structure in the family is completely equal, LKT still depends on the donor's willingness, the recipient's intentions, an assessment of the potential risks to the donor, a review of medical problems that can affect the recipient, and several other factors. Moreover, it has been reported that decisions regarding LKT can affect the relationship between the recipient and his or her close relatives. On the other hand, the choice of waiting for CKT while undergoing dialysis is independent from the family power structure and does not create expectations or guilt toward the family, thereby becoming the only option that the patient can choose autonomously. In Japan, the overwhelming majority of kidney disease patients choose this option although fewer patients are eligible to undergo CKT compared with LKT. This is because organ transplantation is a form of treatment made possible by resourcifying organs<sup>10</sup>. However, compared with Western countries, a few number of people in Japan are willing to donate their organs to non-relatives, reflecting the feeling of resistance toward resourcification. As a result, CKT, as an autonomous option for kidney disease patients which is not under the influence of family-related factors, remains relatively unrealistic.

*2. Insufficient autonomy and suffering associated with dialysis.*

Kidney disease deteriorates over a long period of time during which patients fail to control the disease progression and eventually reach a stage that requires dialysis or transplantation. Our participants felt their autonomy was incomplete in two ways: 1) they could not comprehend the disease onset in the early stages because there were virtually no symptoms associated with the disease; 2) Doctors did not always provide sufficient information on effective ways to prevent or decelerate kidney deterioration. In particular, patients often received ambiguous advice about their salt and protein intake during early stages. In some cases, even physicians may not be confident whether kidney deterioration can be stopped if patients follow such advice. Our participants rarely discussed the medical causes of their illness and described feeling regret that they were responsible for the deterioration of their kidney and dissatisfaction with their physicians.

Such feelings appear to be related to the long-term dialysis-associated suffering that the participants experienced. Although some could predict that the initiation of dialysis was inevitable, those who were informed of the need for dialysis by physicians with virtually no subjective symptoms were significantly shocked. A study investigating psychological pain among dialysis patients in Japan

has reported a high incidence of subsequent depression in patients (and their families)<sup>11</sup>. Unlike conditions that involve few symptoms, patients who begin dialysis perceive the suffering to the body, as well as that associated with constraints in their social life. From this experience, patients for the first time understand that their disease severely affects all aspects of their life and realize that they have no option but to adapt by changing their intended life plans. However, patients eventually become accustomed to life on dialysis and accept that the condition may remain unchanged over their remaining lifetime. Researchers who analyzed the life histories of chronic disease patients describe this as biographical disruption<sup>12</sup> due to a chronic disease. However, patients may keep on hoping that they will undergo CKT someday and thereby may be able to discontinue the painful dialysis. Therefore, patients simultaneously consider the situation of life-long dialysis as well as the potential of undergoing CKT and recovering. Two participants (B and C) shared the experience of receiving a notice of CKT that was never performed. The possibility of such an event makes their future situation increasingly uncertain.

### *3. Consideration for others and the recipient's dilemma.*

Patients who could undergo CKT understandably perceive transplantation in different ways depending on their postoperative condition. C, whose postoperative condition was not as good as expected, told a story that was very different from the other three participants. Unlike what he had envisioned before transplantation, C could not even freely venture out. However, he continued to convince himself to think that it was nice to have undergone the surgery out of his concern for the donor. Recipients feel responsible for the sacrifice made by donors, and it is said that a recipient feels guilty for the donor when organ rejection occurs and the recipient cannot return to normal life. However, guilt toward the donor is reduced if the postoperative course is favorable. Therefore, recipients in Japan have a psychological tendency of regarding a failed transplantation as their responsibility. This seemingly excessive tendency of remorse may be related to the feeling of regret for failing to prevent kidney deterioration during the early phase of their life history.

The other three participants who experienced significant improvement from the dialysis-requiring conditions also had complex feelings toward the donors and their families. Any form of organ transplantation other than living organ transplantation occurs only when a potential donor dies. Therefore, a large number of transplantation candidates are morally conflicted with the situation of waiting for someone to die. Griva et al. reported

that people suffering from guilt are fewer among CKT patients than among LKT patients<sup>13</sup>. However, the results of the present study suggest that CKT recipients may also feel responsible and guilt toward the donors. Sato et al. described that the views of life and death, religious beliefs, and ethical standpoints among the Japanese prevent the donor kidney and the recipient's body image from being integrated<sup>14</sup>. Moreover, some people cannot accept the presence of a part of someone's dead body in their own body or feel that there may be a curse of the dead.

One may argue that many of such conflicts experienced by the recipients are caused out of concern for others (i.e., the deceased donors and their families). In Japan, organ transplants may be performed when there is a strong relationship with a relative or if there is an anonymous non-relative donor. The former causes a dilemma to the recipient (or recipient candidates) because of the close relationships in the form of wanting to receive a gift, but not wanting to impose a risk to the donor. The latter results in a dilemma to the recipient who receives a gift from a non-relative and they are concerned that the person providing the gift is dead. Both are interpersonal dilemmas. In the case of CKT, a "Thank You Letter" is available as a means to mitigate this dilemma. Under the current system, no contact between the donor (or the donor's family) and the recipient are permitted, and the recipients can only express their appreciation to a nameless donor. However, the donors' role to the recipient is not simply a supplier of a resource, but rather an individual whose name they are not allowed to know. The stories of our participants revealed that to the recipients, the kidney provided by an anonymous donor is not a resourcified organ that is anonymous and abandoned, but is instead a gift from a specific individual that they must continue to cherish, regardless of whether the transplantation was successful or not.

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## The influence of Islamic religious rulings (*Fatwa*) on medical practice in Pakistan, the case of pregnancy with fetus having birth defects

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### Abstract

Termination of pregnancy is a debated and disputed topic in almost all major religions of the world. In Pakistan, the topic is disputed because Islam is the major religion and most of the population residing in Pakistan is Muslim. This article highlights the case of a 22 year old woman, 24 weeks pregnant, admitted for termination of pregnancy because of fetal anomaly. The father was against the decision of termination of pregnancy and his verdict was grounded on the fatwa by religious expert mentioning that pregnancy should be continued regardless of the outcome with reference to the Quranic Verse in Sura Nisa. These types of clinical situations are very prevalent in hospitals of a developing country like Pakistan and illustrate a conflict between religious and moral values and beliefs. Autonomy of vulnerable groups and decision-making capacity is controversial even if the decision is being made by weighing benefits verses risks associated with a particular treatment modality. The power deferential and autonomy of women over their life and body living in a developing country in diverse perspective can also be perceived in such cases. The paper addresses sensitive issues that raise questions about the impact of religious rulings on ethical/medical decision making.

## **Introduction**

Human life is both irreplaceable and unique, and since the fetus is a formative stage of human life, rights and protection are conferred upon fetal life (1). Many questions arise when referring to fetal life and fate; the first and foremost question is who has the right to decide about the fate of the fetus in cases where a fetal anomaly is detected or revealed? Is this right if the mother takes the decision or it should be the father or both? Or should the healthcare personnel decide as they have the knowledge that can act as a guiding light for taking the right decision or this right should be of the religious scholars as their advice is in the best interest of a person with their vast experience and knowledge about religion? The neutral approach on this issue can also be that they all share a mutual right on the fetus but then the question arises that whose decision should be respected if there are conflicting decisions and on what basis or grounds action should be taken?

This paper presents the ethical dilemma that exists between the medical science and religious scholars in terms of deciding the fetal fate in case of fatal abnormality identified during pregnancy. This paper also addresses the question: does religious fatwa made by religious experts guide medical practice or do they blur the path in making ethical medical decisions.

The term therapeutic abortion is defined as "those recommended by the healthcare provider to protect the mother's physical or mental health" (2). The debate over therapeutic abortion is still controversial as ever and is a politicized and contested topic in many countries. Although, it has commonly been practiced throughout most of the world even before the beginning of recorded history, it is still a subject in controversy and is raising questions about human existence. The controversies are pertinent to the question that when life begins and what makes us human, the right of women to control their own bodies and exercising autonomy versus the decision of father of the fetus. Thus, a strong tension is seen between secular and religious views of human life and the individual and society, the rights of spouses and parents to be involved in the abortion decision, and the conflicting rights of the mother and the fetus (3)

The newly emerging argument of a western ethicist in medical ethics is "quality of life" which is a relative and subjective term. The term is relative and subjective because people with different background and culture will have a diverging range of understanding of the term "quality of life". This argument affirms that life is worth living only if it maintains a certain level of happiness and only when the living person does not harm the society or surrounding people. If in the case of human fetus

these conditions are not met, than the fetus may have a "right not to be born," and it should be possible to abort the human fetus (4). Termination of a desired pregnancy due to diagnosis of fetal anomaly is distressful for the women and these women find themselves stuck in the middle of a debate framed as "pro-life" vs. "pro-choice" as women have a sense of love and responsibility toward the fetus and yet they have to make the choice to terminate the pregnancy when fetal anomaly is diagnosed (5). The experience of making this decision becomes extremely distressful for the women when there is a diverging range of opinions pertaining to termination of pregnancy amongst the partners, society and especially religion.

This article presents a case study that addresses a predominantly qualitative exploration of how women make decisions about pregnancy affected by fetal anomaly, with a consideration of husband's and religious viewpoints. This also explores the concept of autonomy of vulnerable groups and their decision-making capacity where religious and moral values are contradictory.

## **The Case**

A 22 year old, pale, weak, malnourished lady was admitted to the obstetrics and gynecology inpatient department of one of the secondary care hospitals of Karachi. Her Weight was 50kg and vital signs were BP 120/80mm of Hg, pulse 125/min, temperature 98 °F. On per abdominal examination her HOF was 24cm, FHS positive and FM negative. Her history reveals that she is 24 weeks plus 3 days pregnant, gravida 2, para 1+0 admitted via OPD for termination of pregnancy. At 22 weeks of gestation her ultrasound revealed a fetus having anencephaly and spina bifida. At the time of admission her plan of care was to admit and start tablet cytotec q6 hrly per vaginal plus arrangement of one pack cell blood. During interview with client it was reported that she was married by the age of 19. She had lastly delivered a baby boy about 1 year 4 month ago by SVD at home assisted by traditional birth attendant. Baby birth weight was not known. No antenatal visit, screening or immunization was done during previous pregnancy. She was not aware of family planning methods. 40 days after her delivery her husband administered her birth control injection IM himself once and this was the only dose administered to her. She belongs to low socioeconomic status, having an extended family. Husband was the only earning member of that family and his source of income was job at medical store. Educational level was primary. She also had interfamily conflicts for TOP (Termination of Pregnancy) i.e. her husband was not in favor of TOP resulting in separation. Psychologically she was very disturbed because of TOP, separation and

conflict with husband. She also had a history of domestic violence due to conflict with her mother in law. As her socioeconomic status was low so diet was not according to requirement and she was also not taking any supplements.

As patient admission for Termination of Pregnancy was not in the knowledge of her husband, the team contacted her husband in order to take his consent and to settle conflict between them to an extent. Her husband arrived at hospital very anxiously and was very angry as he was not in favor of termination of pregnancy for which he provided three ultrasounds from different labs but mentioning the same findings and also fatwa in which it was suggested that this pregnancy should be continued regardless of the ultrasound findings. The statement written in Fatwa was supported by a Quranic verse of Surah Isra, chapter 17, verse 31 "And do not kill your children for fear of poverty. We provide for them and for you. Indeed, their Killing is ever a great sin." The team counseled patient and husband regarding the reason for TOP and to understand the context in which it is written. Although, he understood but was in conflict between religious, medical and moral values and beliefs. Finally, two questions were suggested by the team to be asked by those fatwa makers i.e. what if fetus is abnormal, and what should be done if mother's life is in danger. Later on, individual and couple counseling was also done that was focused on need and reason for TOP, family harmony, importance of being together for their child, avoiding miscommunication, ignorance, acceptance, diet to avoid these anomalies in future pregnancies, anemic diet and alarming conditions in which immediate action is to be reported to hospital.

As for termination of pregnancy the consent must be obtained from both parents and in this case, the father was not in favor of termination of pregnancy therefore, Patient was discharged without TOP and family conflict was settled to a certain extent. The team tried to contact the couple for follow up but was not able to do so.

## Discussion

### A- Religious Ethics: Debate of Termination of Pregnancy in Islam.

If all the major religions of the world are consulted on the issue of termination of pregnancy depicted here, they may unanimously consider life as sacred that is initiated with conception and ends with death. The Catholic Church does not allow abortion under any circumstances; Buddhists also oppose abortion; Judaism allows abortion when the life of the mother is threatened but otherwise considers it to be forbidden and Islam is no exception in this matter (6).

As religious, cultural and philosophical conceptions influence decision making of the patient and also influence medical teaching and practice (7), healthcare professionals in Pakistan need to consider what religion has to say about the issue of termination of pregnancy in fetal anomaly. Islam is the major religion in Pakistan and most of the population is Muslim, therefore, Islamic stand on this issue has a significant value.

In Islam there are various sources for derivation of any authentic ruling and jurisprudence that are divided into primary and secondary sources. Quran, the Holy Scripture and Sunnah, religious actions and quotations of Prophet Muhammad are primary sources that are binding and accepted unanimously by all Muslims. According to Sunni school of law, secondary sources are *Ijma*, consensus; *Qiyas*, analogical reason; *Istihisan*, pure reason; *Al-Maslahah*, seeking public interest; juristic discretion; ruling of first generation of Muslims; and local customs. Secondary sources of Shia school of thought are *Ijma*, consenses; and *Aql*, intellect (8). Other than primary and secondary sources, Muslims also refer to religious *Fatwa* which are formulated as legal opinions pronounced by well-known religious jurists (*mufti*: scholar of Islamic Law). *Fatwa* is an authoritative explanation or clarification of an issue and often in a question answer format. More than one *mufti* can be consulted for *fatwa* on the same issue. These are non-binding legal opinions; therefore, different and even contradictory *fatwas* can appear on the same issue at a specific period in time, in various geographic locations or even in the same country. Thus, a versatile range of opinions exists and we may find disagreements and various opinions regarding the same issue. In addition, even the same *mufti*, when consulted twice about the same matter, might change his mind, and accordingly write a *fatwa* that differs from the first one (9). Since it is a non-binding document, one does not have to act according to the *fatwa* provided.

Islam recognizes, respects and protects human life in all its phases that also includes intrauterine life, and therefore termination of pregnancy is not permitted with an exception i.e. under the most direct medical indication (10). Abortion is totally opposed by one school of thought based on the following verse from the Quran, surah Al-An'am chapter 6, verse 151: "Do not kill your children for fear of poverty, for it is we who shall provide sustenance for you as well as for them". Some other Muslims believe that abortion is permitted only if the mother's health is endangered, and they derive this from another verse of Quran Surah Al-Baqara, chapter 2, verse 233, which states that "A mother should not be made to suffer because of her child", therefore most of schools of thoughts of Islam

emphasize that abortion can only be permitted if the reason for it is serious i.e. threat to mother's life or the probability of giving birth to a deformed or defective child (11). However, gestational age is a significant factor in allowing abortion because a Hadith of Prophet Muhammad categorizes fetal life into different stages: "Each of you is constituted in your mother's womb for forty days as a *'nutfa'* (male and female semen drops), then it becomes an *'alaqa'* for an equal period, then a *'mudgha'* (like a chewed piece of meat) for another equal period, then the angel is sent, and he breathes the soul into it, and again when forty-two nights have passed over the sperm drops, Allah sends an angel to it with four instructions. The angel is ordered to write the sustenance, life span, deeds and whether eventually his lot is happiness or misery, then to blow the spirit into him" (12). It is interpreted from this Hadith that the fetus receives the soul after 120 days and thus enters into "personhood" and at this stage, abortion becomes a crime. As every life has a purpose and the purpose is determined by God, therefore an elective violent termination of life is viewed as a protest against God's will and wisdom (13).

Quran and Hadith mark when it is permissible to have Termination of Pregnancy and when it's not. Whereas, the role of *Fatwa* seems ambiguous and open to interpretations. Referring back to the case study provided earlier it can be debated that the context was not properly understood therefore the reference cited in *Fatwa* was irrelevant to the situation. Therefore, it is a point to ponder whether these religious fatwas are guiding medical practice or they lead to a blurred pathway.

#### *B- Secular Ethics: Debate of Termination of Pregnancy in Medical Ethics.*

Analyzing this scenario in the light of basic principles helps one understand the underlying conflicts in particular with its impact on decision making in the context of developing countries. The first and foremost ethical principle is autonomy that is best expressed in terms of decision making capacity, particularly in the form of informed consent. This case poses a range of questions with regard to the principle of autonomy including but not limited to: whose autonomy should take precedence for guiding decision and on what grounds? Does autonomy of father over fetus outweigh mother's autonomy or vice versa? From whom the informed consent should be obtained? Autonomy in case of fetus is referred to a mutual decision of both the parents and therefore, obtaining consent from both parties is important prior to taking any decision for fetus. However, Islam offers a varied viewpoint for autonomy in case of fetus, for example, according to Hanafi scholars, a pregnant woman could have an abortion

without her husband's permission, but she should have 'reasonable grounds' for this act (14). Based on this it can be said that religion places the mother's autonomy over father's autonomy. However, the society where these cases are prevalent is patriarchal and women's decision making are controlled and inclined by men at every stage of life be it daughter, sister, wife or mother. The autonomy of women is not assumed as equal to men. The second principle to consider in this case is beneficence and non-maleficence. Motivation of TOP in fetal anomaly is to offer benefit to family and preclude harm. The initiative for individual and couple counseling was based on this principle and the objective was to settle down conflict amongst them for facilitation of mutual shared decision making and relationship. The intensity of conflict demanded multiple sessions of counseling but it was not achieved because of loss to follow-up.

#### *C- Conflict between Religious, Moral and Medical Values.*

Religious, moral and medical values may be in conflict. The moral value is to make sure of safe motherhood whereas, religious value is contradictory, and medical value signifies that the probability of putting wife's and child life in danger is great if the pregnancy is continued. Laszlo mentioned in an article that "the rift between science and religion needs to be assessed not merely on pragmatic grounds, on the basis of the effect of science versus religious beliefs on people's behavior"(15). Hence, religious values and beliefs influence selection of treatment for medical decision and client autonomy needs to be respected as well. Similarly, healthcare professionals involved in this scenario are also in moral conflict because as a health care professional, one could think that TOP at this stage is much safer rather than continuing pregnancy that may have adverse outcomes but HCPs cannot take a paternalistic approach by imposing their opinion on patient as it will override patient's autonomy.

#### **Conclusion**

This culturally sensitive thought provoking case presents clinical ethical dilemmas resulting from conflict amongst religious, medical and moral value beliefs. Autonomy and decision-making process for vulnerable groups is controversial even if the decision is being made by weighing benefits verses risks associated with a particular treatment modality. Scenarios like this happen in almost every hospital in a developing country the context of a vulnerable population which in this case is about pregnant women and fetus.

*Fatwa* provided in this case was imprecise and was irrelevant. The *Fatwa* should have provided

recommendation based on the guidelines provided in authentic sources regarding action in case of fetus having birth defects rather than the worry over financial expenses. The better approach for giving medical related *fatwa* should be either consultation with medical professional before issuing *fatwa* in order to have a complete understanding of background of the situation or involving medically expert *fatwa* makers.

The possible factors to consider dealing with such type of cases can be keeping societal norm under consideration as they will be a guiding force in resolving these types of ethical dilemmas. First of all, clarification of own values and beliefs because understanding professional and clarifying personal values are important in order to be free from bias, being nonjudgmental and nondirective (16). Religious, moral and medical value conflicts should be resolved to enable one to address the situation in better terms. In addition, awareness sessions and comprehensive research for health care professionals will strengthen their power on subject and will provide a guiding path while counseling. Moreover, consent policies in such cases should be reviewed and followed strictly so that conflicts can be minimized. As peri-natal mortality, morbidity and anomalies elicit complex emotional and psychological issues, psychological support at this time is important and must be done.

The effect of religious convictions and culture on the decision of family to terminate pregnancy and their experience of guilt and going against God's will are important issues to be considered by health care professionals. It can be concluded that Islamic law is a disputed domain; there's much debate on almost every topic even among scholars that produce *fatwa* therefore the question arises: 'How does religious *fatwa* influence medical practice?'

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## A study on the knowledge of bioethics among prospective biology teachers

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### Abstract

This research was conducted to examine the knowledge of bioethics among students of teaching biology, the sources of their knowledge about bioethics and their response to various problems as examples of bioethics study. This research is important because bioethics is becoming an important part of the curriculum developed for students of teaching biology. Through survey research results, 75% of responding students of biology knew bioethics in vocabulary but did not have a deep understanding of it, and 25% of respondents did not know bioethics either in vocabulary or its understanding. From all respondents, 79.68% stated that bioethics was very important to be integrated in the biology course that already exists in the curriculum and 20.32% stated that bioethics was important to be given and become the main subject in the curriculum. Moreover, 75% of respondents who knew bioethics in the context of vocabulary but did not have a deep understanding of bioethics had learned about it from various sources, namely: articles 21% of respondents, books 4% of respondents, internet 48% of respondents, senior students 16, 33% of respondents, teachers and lecturers 10% of respondents. Furthermore, most respondents agreed and strongly agreed on various problems presented as relevant to bioethics case studies, namely: (1) environmental damage caused by pollution; 2) the low moral and ethical aspects of life; 3) exploitation of animal life on land and sea.

### Introduction

Bioethics is as an observation of the moral dimensions of decision in relation to health and in contexts involving biological knowledge and biological issues (Shannon, 1987). It is a new discipline that bridges between fact and value (Apressyan et al. 2008), that combines biological investigation, scientific technology and ethical

issues as well as a biology and humanistic knowledge (Burnham and Mitchell 1992), and studies ethical issues and decision-making related to the use of organisms (Macer, 2008). Bioethics learning has not been part of the curriculum in the form of main subjects or materials that are integrated or collaborated with the existing subjects in the field of biology.

The importance of bioethics for students of teaching biology is that the students are required to have the thinking and learning skills, as called by Moylan (2008) as 7-Cs, namely: 1) Critical thinking and problem solving; 2) Creativity and innovation; 3) Collaboration, teamwork, and leadership; 4) Cross-cultural understanding; 5) Communication and information fluency; 6) Computing and Information & Communication Technology; 7) Career and learning self-reliance. Maftuh (2016) states, human resources in the 21<sup>st</sup> century must behave ethically.

The competence of ethical behavior is formed through the learning of bioethics, so the purpose of bioethics learning becomes important for prospective teachers. In order to be able to implement the learning of bioethics, it must be collaborated with various sources of other disciplines, even with experts from other scientific disciplines. Helland (2002) says that the development of bioethics requires cooperative effort from philosophers, doctors, scientists, lawyers, theologians, sociologists and politicians, since there is no one field that can be more precise to study bioethics because it is interdisciplinary.

Attempts to establish ethical competence through bioethics learning in biology students are important efforts, so it must be started by knowing the students' initial knowledge of bioethics, the expectations of bioethics, as well as the ethical decisions related to the ethical dilemma of life's problems. However, *first*, bioethics has not been developed as a subject for biology teacher candidates or in collaborative or integrated studies with other subjects. *Secondly*, bioethics can be expected to help solve ethical problems of life involving moral and ethics, so that ethical problem of life related issues of life ethics can be a focus. *Third*, teaching bioethics to biology students increases the hope that in the future students will gain knowledge about bioethics from their biology teachers.

Moreover, studying bioethics must be serious; Green and Wishart (2008) firmly state that understanding bioethics is not easy, so students must take part to understand bioethics by deep thinking process. Through thinking deeply biology teachers can improve thinking skills and learning skills, so that bioethics as an interdisciplinary study

can be mastered well by students. Macer (1999) asserts that bioethics is love of life.

The priority of bioethics learning is to cope with the development of science and technology and the emergence of various ethical dilemmas on science products and human actions and behaviors that impact on life. As Mustami (2009) asserts, the world of education is currently facing a challenge by rapid technological development, full of uncertainty and dilemmas. Tsekos and Matthopoulos (2014) state that uncertainty is a characteristic of the environment, and biological phenomena raise matters of social life. According to Ranjan (2000) education teaches respect to nature and environment, society and social values. Therefore, a study on students who are prospective biology teachers regarding bioethics knowledge and bioethics problems is important for the development of bioethics learning so that in the end of a process occurs which is called by Takahashi (2016) as happiness in bioethics.

## Method

This study was conducted on respondents who were prospective biology teachers who had taken the courses of zoology and ecology. The study was designed with a qualitative descriptive approach with observation, questionnaires and in-depth interviews to collect data on bioethics knowledge, the source of bioethics knowledge, decisions on problems related to bioethics and perceived impact to ethical dilemma on respondents. The data that had been obtained were processed with frequency distribution in percentage form.

The responses of respondents are stated based on scores in four categories: strongly agree (4), agree (3), disagree (2), and disagree (1). Class categories with intervals of 0.75 are used as follows: Strongly Disagree (1.0-1.75), Disagree (1.75-2.5), Agree (2.5-3.25), and Strongly Agree (3.25-4.00). This research was conducted on students who have not received bioethics learning in campus, and the expectation of this research is to produce data to recommend bioethics as an important study included in the curriculum of prospective Biology teacher.

## Results

### a. Knowledge and resources of bioethics

Based on data conducted on 123 students, the knowledge of students of teaching biology is low; 75% of respondents have knowledge of bioethics in the context of knowing the word bioethics and have not known yet the meaning of bioethics and 25% of respondents are not familiar with bioethics, both as a word and a term or a definition, so bioethics is known as a new designation. The information used by 75% of respondents in knowing the word

bioethics comes from various sources, 48.33% from the internet, 20.67% from articles, 16.33% from senior students, 10.30% from teachers and lecturers, and 4.37% from reference books. Similarly, the response of respondents to bioethics, 78.50% of respondents stated that bioethics is very important to be given to student prospective Biology teacher although it must be integrated in Biology subject which already exist and 21.50% of respondents said bioethics is very important and is expected to be the main subject for prospective Biology teacher.

### b. Respondents' response to ethical dilemmas

Various life problems that cause ethical dilemmas were presented to the respondents through questionnaires. There were three basic problems: 1) Problems related to the environment, 2) Problems of moral and ethical awareness, and 3) Problems in animal welfare. Most respondents agreed and strongly agreed that the problems had an impact as ethical dilemma and were worthy of study in bioethics learning, as seen in table 1.

**Table 1:** The response of students (prospective biology teachers) in the assessment of the bioethical problems in life.

Bioethics Problems	Mean	Category
A. Environmental Damage:		
Land Pollution	3.39	Strong agree
Water Pollution	3.40	Strong agree
Air Pollution	3.25	Strong agree
Sound Pollution	2.20	Agree
Beach Damage	2.75	Agree
Coral Reefs Damage	2.75	Agree
Deforestation	3.01	Agree
Beef Damage	3.35	Strong agree
Exploiting Natural Resources of Mining	3.55	Strong agree
Exploiting Natural Resources of Sea	3.35	Strong agree
Having low awareness of environmental conservation	3.55	Strong agree
B. Having Low Morale and Ethical Life Sustainability:	3.67	Strong agree
C. Animal Treatments:		
Fishing at sea with bombing	3.40	Strong agree
Fishing at sea with poison	3.39	Strong agree
Exploiting sharks' fin and throwing sharks back without fins in the sea	3.55	Strong agree
Exploiting manta ray gills with sadistic hunting	3.55	Strong agree
Serving frog soup a live	3.55	Strong agree

The desire of students to have bioethics in the existing curriculum as a main subject is evidence of the emergence of awareness of the importance of bioethics. Making bioethics a part of an existing curriculum will support reform in teaching, because according to Yali (1997) the reforms are better than the old ones. Learning bioethics will certainly encourage students to become humanists and have a good personality. Humanists according to Pelligro in Nalini (2013) includes two components namely cognitive and affective, as according to Haryadi and Aripin (2015) cognitive and affective component can be trained in learners.

Haryadi and Aripin (2015) also mention that the cognitive component is closely related to the mind, memory, reason, intellectual, numeracy, logic, exact science and academic. The affective component is closely related to the psychic, which includes attitudes (enjoyment, respect), rewards (reward, punishment), values (moral, social), and emotion (happy, sad).

Students get information about bioethics enormously from the internet; the internet is the most dominant source of information for students. However, information about the bioethics from teachers and lecturers has very low percentage, so it can be interpreted that teachers and lecturers have not been effective in discussing bioethics on teaching-learning activity. According to Arends (2007), the role of teachers is to help students acquire new knowledge. The absence of bioethics courses and bioethics studies that are integrated in the course can be interpreted as many lecturers never mention the issue of bioethics. It is supportive to recommend the importance of bioethics in the curriculum for students.

Although students are not familiar with bioethics yet, their response to the exposure to various life problems with ethical dilemmas were positive. Most of the students strongly agree that the problems related to environmental aspects, moral and ethical awareness and animal welfare aspects (in zoological studies) deserve to be an important study in bioethics. Moreover, a small proportion agrees that pollution, coastal damage, coral reef destruction and deforestation are related to bioethics.

The respondents strongly agree that the cause of environmental problems is the low morale and ethics of survival; according to respondents, any human action is inseparable from morals and ethics, so that environmental problems occur because morality and ethics have a great role in decision making. If the decision is good, then people will not exploit and destroy the environment for personal gain or group. Moral norms as stated by Magnis (1989) are the benchmarks used by society to measure one's goodness. As an example, the

environment Climate Action Network (CAN) (2007) states that about 8 million to 16 million hectares of tropical forests were damaged annually between the 1980s and 1990s. This destruction released 0.8 billion to 2.4 billion tons of carbon into the atmosphere and 20% of global warming is caused by deforestation.

Based on various bioethics problems presented, all students stated strongly agree that the low morale and ethics of life sustainability is a serious bioethics problem, as shown by a mean of 3.67 of the class categories achieved from all items of bioethical problems. These data indicate that the concerns of students on moral and ethical issues are very high. Macer (1999) asserts that bioethics is love of life.

## Conclusions

The result of this research is that the knowledge of biology teacher candidates is still low because there is no subject matter in the curriculum. It can be stated that the interest of students is very high in bioethics. The expectations shown by students is to make bioethics a part of the learning curriculum even though it must be integrated in the existing biology subject or become a major subject to be followed up. This study can recommend an analysis of the need for the importance of bioethics for student of teaching biology.

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## **Bioethical issues in dental practice and prevention: Is dentistry paternalistic?**

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### **Abstract**

Paternalism is not acceptable in dentistry today because it eliminates the patients' right to choose the treatment they feel is right for them, even if their choice is not what the doctor feels is best. Paternalism violates the patient's autonomy and self-determination. Dentists accept the ethical principle of non-maleficence and in many countries, are also recognizing the right to informed consent. Most people trust health professionals who serve them. Dentists are among the trusted professionals, and the paper will investigate the attitudes to dentists in several different countries as examples. When patients request inappropriate dental treatment, the dentist must decide how to balance a concern with patients' wellbeing with respect for their choices. It is important for a dentist to keep this in mind and to reflect of its implications, especially when dental practice seems to be changing so much under the influence of the malpractice crises, the changing economic scene, the changing regulatory environment, and so on. A dentist must consider the patient's values and personal preferences, and must involve the patient in the decision-making process. It is the dentist's responsibility to determine the decision-making capacity of each patient with the help of appropriate surrogates. For example, patients may be given choices about which type of tooth repair they will choose, given that there are often choices between what an insurance will cover and what an insurance will not cover. Are dental implants only for the rich, and dentures for the poor? Is there a class divide between a silver, gold or white smile? Ethics affect virtually every decision made in a dental office, encompassing activities of both judging and choosing, relationship with patients, the public, office staff, and other professionals. This paper gives an overview of bioethical issues in dental practice and explains the fact that dental ethics cannot support paternalism even in prevention.

### **Introduction**

Medical paternalism is a set of attitudes and practices in medicine in which a healthcare professional determines that a patient's wishes or choices may not be honored. These practices were

common up to the early to mid-20th century, and were characterized by a paternalistic attitude, surrogate decision-making and a lack of respect for patient autonomy (1). They were undertaken with the intention of benefiting the patient, although this is not always the case. In the past, paternalism was considered an absolute medical necessity, as there was little to no public understanding of medical procedures and practices (2). In the 18th century, medical paternalism was considered necessary. It was believed that only a doctor could properly understand symptoms and draw useful conclusions. During this period, the prevailing consensus was that disease was nothing more than symptoms. This meant that the individual history of the patient didn't matter in providing care, so the patient's view was irrelevant in the medical encounter. Thus, it was deemed necessary that physicians make decisions for patients. This view of paternalism was encouraged by the rise of hospitals in the later 18th century. Because patients in hospitals were often sick and disabled, the view of them as passive recipients of medical care only became more prevalent (3). However, paternalism in recent years has become limited, and a blind faith in doctors' decisions has come to be frowned upon (4).

Medical ethics is changing everywhere with the balance between technology and humanism. The evolution of the concept of patient autonomy is seen in a trend that is reflected in all cultures moving from paternalistic compassion and love toward informed decision making (5). Today, the prevalent presumption is that the patient has a right to know what the physician knows about her condition. This right to know is explicitly related to the right to make decisions about one's own welfare. Treatment should normally be given only with the patient's informed consent, which is only possible if she has access to information about her condition (6). The clinician's first responsibility is to try to improve the patient's understanding of these matters, but patient inattention, cognitive limitations and clinging to false beliefs can limit the success of these attempts. If a good-faith effort to improve her understanding fails, the probability is increased that paternalism is warranted (7).

The moral conflict that characterizes paternalism is between the principle that requires one to respect others' autonomy and the principles that forbid harm and promote benefit to others. But we must also bear in mind that there are cogent moral reasons for respecting patients' autonomy<sup>7,8</sup>. Allowing people to exercise their autonomy as they see fit often will have better consequences in the long run than trying to make decisions for them. Even when people's decisions are shortsighted, ill-motivated or poorly reasoned, the obligation to respect autonomy remains<sup>9</sup>. Like most other moral

obligations, this sometimes can be overridden by other moral considerations. Others have suggested that the obligation to respect autonomy may be overridden by the dentist's obligation to promote the patient's well-being.<sup>10,11</sup>

### **Ethical Issues in Dental Practice**

There are many ethical issues and challenges surrounding the dental healthcare system, perhaps the most important include:

***Patient's life and general health:*** Recommending or performing a treatment that places a patient's life at risk would be unprofessional. A dentist who pays no attention to the connections between a patient's oral condition and the other aspects of the patient's health would be guilty of professional failure. The patient's life and general health have central value.

***Patient's oral health:*** Appropriate and pain-free oral functioning is the next important value. A dentist who leaves a patient with significant oral impairment or painful oral functioning would be unethical.

***Patient's autonomy:*** A dentist must refuse to respect a patient's choice if the action chosen is contrary to the patient's oral or general health. But if a dentist fails to respect the patient's autonomous choice among treatment alternatives in order to maximize esthetic value or cost containment, the dentist would be acting unprofessionally.

***Dentist's preferred pattern of practice:*** A dentist has choices in terms of diagnostic, operative and other dental procedures, in consideration of patient outcomes, patient comfort, efficiency, doctor's comfort and trust in procedure. But the fact that a dentist has a habit of practicing a certain way does not outweigh a patient's autonomous choice, if general and oral health is not compromised.

***Esthetic values:*** Shaping a restoration to proper form and function is part of general and oral health as well as the capacity of the dentist to apply his/her expertise for the patient's benefit. The patient's judgment about esthetic values would rank below the other values. Acting on patient's judgments of appearance never justifies damaging healthy teeth.

***Efficiency in the use of resources:*** A dentist who pays no attention to accepted professional standards or to a patient's value of esthetics for personal, financial or other reasons is acting inappropriately<sup>12</sup>.

### **Ethical principles for decision making in a dental clinic**

The process of ethical decision making by dentists may be simple or quite complex, ranging from "the Golden Rule" to decisions that contemplate the ethical principles or considerations at stake. Ethical

decision making involves both judging and choosing. Emotional state, incompetence, physical and mental disorders, and other conditions may adversely affect a dentist's decision-making capacity. Decision principles, elements, and models are summarized to broaden the dentist's understanding of the processes involved and to accommodate individual needs or preferences.

**Autonomy**—Patients have the right to determine what should be done with their own bodies. Because patients are moral entities they are capable of autonomous decision-making. Respect for patient autonomy affirms this dynamic in the doctor patient relationship and forms the foundation for informed consent, for protecting patient confidentiality, and for upholding veracity. The patient's right to self-determination is not, however, absolute. The dentist must also weigh benefits and harms and inform the patient of contemporary standards of oral healthcare.

**Beneficence**—Beneficence, often cited as a fundamental principle of ethics, is the obligation to benefit others or to seek their good. While balancing harms and benefits, the dentist seeks to minimize harms and maximize benefits for the patient. The dentist refrains from harming the patient by referring to those with specialized expertise when the dentist's own skills are insufficient.

**Compassion**—Compassion requires caring and the ability to identify with the patient's overall well-being. Relieving pain and suffering is a common attribute of dental practice. Acts of kindness and sympathetic listening to the patient are all qualities of a caring, compassionate dentist.

**Competence**—The competent dentist is able to diagnose and treat the patient's oral health needs and to refer when it is in the patient's best interest. Maintaining competence requires continual self-assessment about the outcome of patient care and involves a commitment to lifelong learning. Competence is the just expectation of the patient.

**Integrity**—Integrity requires the dentist to behave with honor and decency. The dentist who practices with a sense of integrity affirms the core values and recognizes when words, actions or intentions are in conflict with one's values and conscience. Professional integrity commits the dentist to upholding the profession's Codes of Ethics and to safeguarding, influencing and promoting the highest professional standards.

**Justice**—Justice is often associated with fairness or giving to each his or her own due. Issues of fairness are pervasive in dental practice and range from procedural issues such as whom shall receive treatment first, to complex questions of who shall receive treatment at all. The just dentist must be

aware of these complexities when balancing the distribution of benefits and burdens in practice

**Tolerance**—Dentists are challenged to practice within an increasingly complex cultural and ethnically diverse community. Conventional attitudes regarding pain, appropriate function, and esthetics may be confounded by these differences. Tolerance to diversity requires dentists to recognize that these differences exist and challenges dentists to understand how these differences may affect patient choices and treatment.

**Veracity**—Veracity, often known as honesty or truth telling, is the bedrock of a trusting doctor-patient relationship. The dentist relies on the honesty of the patient to gather the facts necessary to form a proper diagnosis. The patient relies on the dentist to be truthful so that truly informed decision-making can occur. Honesty in dealing with the public, colleagues and self are equally important<sup>13</sup>.

**Patient's consent, paternalism and some examples**—Informed consent is necessary for today's progressive medical and dental treatment. This allows for patient autonomy, self-determination, and beneficence, thus avoiding paternalism. Dental offices, like medical offices, are able to "provide patients a financial estimate for prostheses and other treatments," and even have patients sign a document acknowledging their financial agreement. Informed consent requires opening the lines of communication between providers (dentist or hygienist) and patients. The provider needs to make sure patients understand their options, and patients then acknowledge they have all the information, benefits, and risks along with their financial obligation. Interestingly, many providers do not take into account the pain people will experience as an ethical problem — "for some, pain still seems to be only a technical problem solved by treatment."<sup>14</sup>

Paternalism is the practice of acting as the "parent," which is taking it upon oneself to make decisions for the patient. Here is an example of paternalism. The patient is given a treatment plan of extracting a painful tooth and fabricating a three-unit bridge for tooth replacement. Due to the patient's age, the dentist feels this is the easiest approach so the tooth will not give the patient any problems in the future. In this case, there is no mention of possible endodontic treatment or replacing the extracted tooth (if extraction is required) with an implant. In another case, a long-term periodontal patient is currently receiving periodontal maintenance recalls every three months. He is a diabetic patient with normal A1C values. After receiving root planing, periodontal pocketing is still out of control, with depths ranging

from 4 mm to 9mm. The hygienist is frustrated and the dentist does not think the patient will consider a periodontal referral due to his age and advanced periodontal condition; thus no referral is offered (paternalism, nonmaleficence). In this example, nonmaleficence is the primary ethical principle at issue. Nonmaleficence is included in the ADA Code of Professional Conduct description as doing no harm and "... knowing one's limitations and when to refer to a specialist or another professional."<sup>15</sup>

Paternalism violates patient's autonomy and self-determination, affects non-maleficence for not giving the patient the right to informed consent; thus, paternalism is the opposite of informed consent<sup>14</sup>.

### Ethical approach for dental practice

Knowing the major principles of healthcare ethics and how to use a model to solve an ethical conflict is the best way to solve a dilemma. Weighing all outcomes is necessary to reach a fair resolution for each party. Working through an ethical dilemma does not come easily but takes practice and careful consideration<sup>16</sup>. Patients deserve to exercise their self-determination, but not at the risk of their dental health. Dental professionals must weigh options that allow a patient's autonomy while exercising beneficence and avoiding maleficence. Exercises or decision models can help work through each dilemma to reach an ethical decision.

The first step, identifying the ethical dilemma, is to pinpoint the ethical problem. Do you have a legitimate ethical dilemma? Are principles in conflict? State the specific conflict, then evaluate and apply the specific healthcare principles that conflict with one another. Without a conflict of principles, there is no ethical problem but merely a right or wrong type of predicament.

Step two, collecting specific information, is critical to the case in question. The information can be specific statements of fact and can come from a variety of sources pertaining to how the conflict began, how it proceeded, and what parties are involved. Information collection is necessary to make a balanced ethical decision.

Step three, state the options, is a step-by-step process or analysis to judge each option and the consequences related to each option. Troubleshoot as many options and their full consequences before proceeding to the next step.

In step four, apply the ethical principles to the options. Beemsterboer recommends, "State how each alternative will affect the ethical principle or rule by developing a list of pros and cons."<sup>17</sup> List each principle violated while considering specific values such as supervised neglect, informed consent, paternalism, and more. Show the pros and

cons of each option and its consequences discussed in step three.

Step five, making the decision, must become apparent by evaluating your pro and con worksheet. One may assume that the option with the most pros would be the correct decision, but carefully evaluating the degree of severity regarding the consequences in the con column may have an affect on your decision.

In step six, you are now ready to implement the decision. There is no sense in going through these six steps unless you're serious about implementing ethical decisions. Without following through and acting on the ethical dilemma, there will be no resolution for the patient or party affected<sup>14</sup>.

### Conclusion

The oral healthcare system should *promote and restore the oral health of the patient and* treatment could be administered in the best interest of the patient. But every human being as well as patient has a right to choose their own healthcare methods. Everyone has a right to maintain their own oral habits like smoking and chewing tobacco although they can lead to oral pathologies. The dentist can only suggest preventive measures and treatment plan but cannot force the patient to adopt such methods. These leads to some serious dilemmas in dentistry and only ethics can solve it. The Code of Ethics provides a basis of shared values in the practice of dentistry to avoid paternalism. Therefore, paternalism cannot be supported even for preventive purposes.

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## Born from the ashes: Ethics and law of posthumous reproduction

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### Abstract

Posthumous reproduction is a profound scientific achievement bestowing biological continuance on human life after death, fulfilling the wishes which were hitherto unattainable. The process has brought hope and joy to many but its implementation is marred by ethical ambiguity and legislative inadequacy. Many jurisdictions in the world claiming to be a part of scientific social order display a highly restrictive and debilitating approach by forbidding posthumous reproduction. In this article I discover the fundamental ethical questions which remain unanswered, analyse the law and the judicial responses across the world and discuss the prevailing conflicts and controversies in

the regulation of posthumous reproduction. I conclude that judicial decisions are no substitute for legislative policies which need to be evolved on priority in view of fast advancing biotechnology and growing affirmation of posthumous reproductive rights

### Introduction

*"They are never going to let me leave this hospital, Mum; the only way I will get out of here will be in a body bag. I want you to carry my babies. I didn't go through the IVF to save my eggs for nothing. I want you and Dad to bring them up. They will be safe with you. I couldn't have wanted for better parents, I couldn't have done without you."*

'A' to her mother

The above statement of a terminally ill daughter as quoted in the 30th June 2016 decision of the UK's Court of Appeal in *Mr and Mrs M. v. Human Fertilisation and Embryology Authority* enabling a 72-year-old woman to give birth to her own grandchild by using her dead daughter's frozen eggs, reflects stark realities of life and has inspired me to write this article. (1) Not long ago, death was the ultimate exit. But, not now. After departure from this planet the dead may continue to live as gametes to create their offspring. Assisted reproductive technologies have made tremendous progress since 1978 when Louise Brown, the world's first "test tube baby" was born and 1980 when posthumous sperm retrieval was first reported by Rothman. (2) One report shows that "human semen stored for approximately 40 years (from 39 years, 10 months to 40 years, 9 months) maintained its ability to result in a live birth through ICSI-IVF" (3). Motile sperms have been successfully obtained as late as 36 hours after death (4). The persons in persistent vegetative state (PVS) or the victims of sudden and unexpected death may become parents after they are no more. Also, those who preserved their gametes before surgical intervention or chemotherapy because of malignancy may become parents after death. "In the 1960s, freezing, or cryopreservation, of sperm was made available to the Apollo astronauts so that even if space travel were to harm their reproductive systems, they could still father healthy children using the stored sperm. During the Vietnam War, soldiers sent frozen sperm back to their wives in the United States so they would be fathers when they returned home" (5).

The process of conceiving children after death, spectacular in its scientific promise, is equally challenging in terms of morality, ethics and law. The ethico-legal paradigms have failed to keep pace with the scientific development and many

fundamental questions remain unanswered. In several jurisdictions there are no legislative enactments in place and the emerging problems are being handled in an ad-hoc manner. Faced with no other option, people have knocked the doors of Courts but the judicial responses have been heterogeneous. On one extreme are the judicial decisions like *Parpaliak v. CECOS* (1984) of the French Court describing the sperm as “the seed of life ... tied to fundamental liberty of a human being” (6); re the *Estate of the Late K* (1996) of the Supreme court of Tasmania, Australia holding that frozen embryos are entitled to acquire inheritance rights (7) and *Parrillo v. Italy* (2015) of the European Court of Human Rights, reaffirming the special status of human embryos, denying their donation even for scientific research (8). On the other extreme are decisions like *Davis v. Davis* (1992) of the Tennessee Supreme Court (9); *Hecht v. Superior Court* (2002) of the California Supreme Court (10) and *J.C.M. v. A.N.A.* (2012) of the Supreme Court of British Columbia, Canada, (11) holding that the parties are entitled to exercise ownership rights on the embryos and take decisions with regard to their disposal as their property. Posthumous reproduction thus suffers from moral ambiguity and legal uncertainty and several vital issues need to be addressed in order to make the process meaningful. In this article I discover the fundamental ethical questions which remain unanswered, analyse the law and the judicial responses across the world and discuss the prevailing conflicts and controversies in the regulation of posthumous reproduction. I conclude that judicial decisions are no substitute for legislative policies which need to be evolved on priority in view of fast advancing bioethnology and growing affirmation of posthumous reproductive rights

### **Ethical Challenge**

The moral status of the human embryo, the nature of the deceased's rights in gamete or embryo, consent of the deceased, respectful treatment of the dead body, rights of the widow or widower, offspring's identity, parentage, consanguinity, legitimacy, rearing, social security benefits, inheritance rights, and participant's religion make the process of posthumous reproduction contentious. The process may include several possibilities such as (i) sperms of the male partner are preserved during his lifetime and the woman's ovum is fertilized and implanted after the male partner's death, (ii) ovum, preserved during the life time of the woman, is fertilized after her death by the sperms of her partner and is implanted in a surrogate, (iii) embryo is created and preserved during the life time of the partners and is implanted

after death of the male partner in the woman whose ovum contributed to the embryo or in the event of her death in a surrogate and (iv) sperms and ova are retrieved from the body of the male and female partners after their death and after fertilization they are implanted in a surrogate. In terms of biological outcome these combinations produce the same result i.e. the birth of a child but each scenario leads to a different set of social relationships and legal consequences. The resulting offspring may be confronted with a host of challenges such as multiple parentage, muddled sibling relationship, consanguineous distortions, family destructuring, emotional stress, deficient rearing, social rejection and legal disputes including problems of inheritance and social security benefits. Despite tremendous progress in assisted reproductive technologies, parental eligibility and obligations remain inadequately defined. In the case of posthumous reproduction, the child may be more vulnerable because of the absence of one or both biological parents. There are primarily four stakeholders in the process namely the deceased partner, the living partner, the child and the State. In view of their stakes, several fundamental questions need to be answered in the context of ethics and law of posthumous reproduction, including the following:

1. Does a person possess a constitutional right to reproduce after death?
2. Does a person possess property rights in his/her gametes or embryo?
3. Can the gametes be bequeathed and inherited like other properties?
4. Can the gametes be retrieved from the body of the decedent on the basis of consent given by his/her spouse/partner or other family member, in the absence of will or advance directive from the decedent?
5. What should be the criteria to determine the intent of the person dying intestate with regard to using his/her gametes for reproduction?
6. Can an embryo be implanted and grown in a surrogate in the event of death of both the partners on the basis of their will or intent?
7. Who will be parents of the child born out of decedent's embryo implanted in a surrogate?
8. Is the woman entitled to implant the embryo created by her ovum and the sperm of the divorced/diseased husband, even after her remarriage? If she is entitled to do so is the consent of the present husband necessary? Who will be the father of the child born in this manner, the deceased /divorced husband or the present husband, or both?
9. Is a posthumously conceived child entitled to inherit the property of his/her genetic parents?

10. What is the role played by the religion in posthumous reproduction?
11. What are the effects on the personality of the child born through posthumous reproduction?
12. What is the level of social acceptance of the child born through posthumous reproduction?

The above issues make the process controversial. Consent of the deceased poses a serious challenge. Incapacitation due to PVS, sudden and unexpected death and the urgency involved in the post mortem gamete retrieval may make the elicitation of consent impracticable. In such cases explicit consent of the deceased may not be available and the implied or presumed consent may be the only option. However, even in jurisdictions where explicit consent is not required, the evidence of implied consent may not be found to be convincing and the fertility clinic may refuse to extract the gametes. "For it seems that in most of these cases, the deceased will not have contemplated the issue of posthumous reproduction or made their views explicit. Consequently, the presumption against consent effectively prohibits posthumous reproduction in the very situations where it is most likely to be requested" (12).

Participant's religion may further complicate the problem. Major religions including Catholicism (13) and Judaism (14) do not approve posthumous retrieval and use of gametes. 'Islam also rejects this procedure because it takes place after the end of the marital term' (15).

The only credible way to answer the above questions is through consensus among all actors of civil society and evolution of suitable legislative strategies. This is a difficult task owing to diverse perspectives emerging out of religious beliefs, cultural sensitivities, socio-economic imperatives and varied value concepts. Furthermore, the individual and common approaches vary because of the accompanying circumstances. An issueless person, suffering from terminal illness or afflicted with malignancy needing chemotherapy may be genuinely interested in preserving his/her gametes which may not be a relevant factor in case of others. Legislative enactments therefore have to be comprehensive and in a holistic way capable of addressing multiple concerns and priorities. As we will see in the later part of this paper, in view of legislative inadequacy the courts of law have attempted to answer some of the aforesaid question through judicial pronouncements, while several of them remain unanswered.

## **The Law**

The laws on posthumous reproduction present a heterogeneous picture across the world. "Among developed nations, the U.S. assisted reproduction or

fertility industry is one of the least regulated" (16). Posthumous reproduction is not prohibited by law in the USA. In the context of posthumous reproduction two uniform laws may come in to operation: The Uniform Probate Code (UPC), 1969 and the Uniform Parentage Act (UPA), 2002. The UPC governs inheritance and the decedents' estates in the United States. It has no specific provisions with regard to children born out of posthumous reproduction and as such it is not of much help in addressing their inheritance rights, except in general terms. The UPA, approved in 1973, last amended or revised in 2002, provides a uniform legal framework for establishing paternity of minor children born to married and unmarried couples. Section 707 of the UPA deals with the parental status of deceased individuals. It lays down, "If an individual who consented in a record to be a parent by assisted reproduction dies before placement of eggs, sperm, or embryos, the deceased individual is not a parent of the resulting child unless the deceased spouse consented in a record that if assisted reproduction were to occur after death, the deceased individual would be a parent of the child" The Act leaves several vital dimensions of posthumous reproduction unaddressed.

Assisted reproduction seems far better regulated in Canada as compared to the USA and several other countries. The process is regulated by the Assisted Human Reproduction Act which came into force in 2007. The Act was last amended on September 30, 2012. Section 8 (2) of the Act relates to posthumous use of gametes and lays down, "No person shall remove human reproductive material from a donor's body after the donor's death for the purpose of creating an embryo unless the donor of the material has given written consent, in accordance with the regulations, to its removal for that purpose" (17). As regards the parentage, "The *Uniform Child Status Act (2010)*<sup>2</sup> provides that a posthumously conceived child, or a person who was "married to or in a common-law partnership with" the person who is alleged to be a parent of that child, may apply to court for an order declaring that a deceased person is the child's parent. However, the court may only grant the order if it is satisfied that the deceased's "human reproductive material" was used, and that the deceased consented in writing (and did not withdraw such consent) to be the parent of a child conceived posthumously. Although not binding on any particular province, this uniform act serves as a suggestion for the harmonization of laws between provinces and can be expected to inform discussion and drafting throughout Canada." (18)

In the UK, Sections 39-41 of the Human Fertilization and Embryology Act, 2008 (HFEA) contain provisions with regard to insemination by

the sperms or the embryo created by the deceased's sperms. The law allows postmortem fecundation but, along with other riders and restrictions. It mandates that a man whose sperm has been used after his death must be considered the father of the child only if he has given written consent (and did not withdraw the consent) to use his sperm after death and the woman has elected in writing not later than the end of the period of 42 days from the day on which the child was born for the man to be treated as the father of the child, subject to the condition that no-one else is to be treated as the father of the child by virtue of section 35 or 36 or by virtue of section 38(2) or (3), or (ii) as a parent of the child by virtue of section 42 or 43 or by virtue of adoption.

Post mortem fecundation is forbidden in many states of Europe such as Austria, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia and Sweden. It is allowed in Belgium, Greece and, Spain. There are varied restrictions on the time after death by which fecundation must be started or completed. In Belgium and Greece it is between 6 months to 2 years after the donor's death while in Spain it is up to 12 months after the donor's death (19). The European Society of Human Reproduction and Endocrinology (ESHRE) provided guidelines in 2006 suggesting that PMSR be offered only if the deceased had provided written consent and that, furthermore, the sperm could only be used after extensive counselling and at least 1 year after the death (20).

### Australia

In Australia, the legislative scenario is heterogeneous and "it is important to refer to the law in each state/territory, and/or National Health and Medical Research Council, Ethical Guidelines on the Use of Assisted Reproductive Technology in Clinical and Medical Practice and Research (2017) (The *NHMRC Ethical Guidelines*) in order to determine whether the *removal* and or *use* of gametes after a person dies is permissible, and if so the circumstances in which this may occur (21). Assisted Reproductive Technology Act 2007 (NSW) provides that use of gametes or embryos is permitted after death if the gamete provider has consented to the use of the gamete after his or her death, the woman receiving the ART treatment has been notified of the death or suspected death of the gamete provider and the date of death (if known), and the woman receiving the ART treatment has given written consent to the provision of the ART treatment using the gamete despite the death or suspected death of the gamete provider. (22)

In Victoria, Section 46 of Assisted Reproductive Treatment Act 2008 (Vic) provides that "A registered ART provider may use a person's gametes, or an embryo created from the person's gametes, in a treatment procedure after the person's death only if- (a) the treatment procedure is carried out-(i) on the deceased person's partner; or (ii) in the case of a deceased woman, by the woman's male partner commissioning a surrogacy arrangement in accordance with Part 4; and (b) the deceased person provided written consent for the deceased person's gametes or an embryo created from the deceased person's gametes to be used in a treatment procedure of that kind; and (c) the Patient Review Panel has approved the use of the gametes or embryo; and (d) the person who is to undergo the treatment procedure has received counselling under section 48". (23)

In South Australia, Queensland, Australian Capital Territory, Tasmania, Western Australia and Northern Territory, there is no specific legislation on ART. The use of ART for posthumous reproduction may be subject to the Court orders and may be facilitated by the NHMRC Ethical Guidelines.

### Israel

At present there is no comprehensive legislation on posthumous reproduction in Israel. The Bill in this regard is about to be submitted to the Knesset (Israeli Parliament) for consideration. According to the proposed bill, in the absence of provisions made in writing by the deceased, "his wife or steady partner alone may become impregnated from the sperm of the deceased or inseminate her eggs with his sperm..." As currently drafted, it also provides that "relatives of the deceased, except his wife or steady spouse, will not have any standing regarding extraction or use of his sperm, except if the deceased was not married or did not have a steady partner at the time of his death, and only if he instructed so in writing..." As of July 2017, it has yet to be submitted to the Knesset for consideration (24).

### Judicial Decisions

In 1984, prior to the enactment of legislations forbidding posthumous reproduction, the French Court, in *Parpaliax v. CECOS*, while determining the fate of deceased's sperms, refused to treat them as an ordinary moveable property. Instead, the Court described the sperm as "the seed of life... tied to fundamental liberty of a human being to conceive or not to conceive." (25)

In the USA, in *Hecht v. Superior Court*, the California Superior Court allowed a probate court to assume jurisdiction over the sperm as property of the decedent. The Court observed: "Given the

procedural posture of this case, and the fact that, for purposes of addressing real parties' arguments, we are assuming that decedent intended to allow Hecht to use his sperm for posthumous artificial insemination, it is premature for us to apply the Davis test. At this point, the only issue which we address is whether artificial insemination with the sperm of a decedent violates public policy. There is nothing in Davis which indicates that such artificial insemination violates public policy." and held, "For the foregoing reasons we conclude that the trial court abused its discretion in ordering decedent's sperm destroyed" (26). As regard the inheritance and social security benefits to posthumously conceived children the judicial decisions in the United States have been conflicting. In re estate of Kolacy the Court decided the twins were the deceased husband's heirs and once paternity is established, a posthumously conceived child should receive the legal status of heir so that they are able to take property from their parents (27). In *Woodward v. Commissioner of Social Security*, the Massachusetts Supreme Judicial Court held that a posthumously conceived child must prove a "genetic relationship between the child and the decedent" and the decedent must have affirmatively consented to posthumous reproduction and support of any resulting child. In this case, the court compared the succession rights of the children conceived before and after the death of the husband. In this context, the Court identified three "powerful" state interests: "The best interest of children, the . . . orderly administration of estates, and the reproductive rights of the genetic parent." The Court directed the state legislature to address this subject through statute (28), the Court of Appeals for the Ninth Circuit awarded Benefits to the Twins of Rhonda Gillett and Robert Netting, holding that they were Netting's children and met the Act's dependency requirements (29).

The United States Supreme Court case, *Astrue v. Capato*, aptly reflects the negative legal implications arising out of posthumous reproduction with regard to social security benefits and inheritance rights. Shortly after marriage with Karen Capato, in May 1999, Robert Capato was diagnosed with oesophageal cancer for which he was administered chemotherapy. Robert deposited his sperms in a sperm bank to be preserved and used for IVF. In March 2002 Robert died of cancer. Using Robert's preserved sperms Karen became pregnant and delivered a pair of twins. Shortly afterwards, Karen claimed survivorship benefits on behalf of the twins under the Social Security Act. Karen's claim was rejected by the Social Security Administration. Karen filed an appeal in the US District Court of the District of New Jersey which affirmed the Administration's denial of benefits to

twins on the ground that Robert has not mentioned any biological children born after his death as inheritors of his property in his will and as such the twins cannot be treated as his "child" in terms of Section 416(h) of the Social Security Act. Karen appealed to the Court of Appeals for the Third Circuit which reversed the District Court's decision in her favour holding that "the undisputed, biological child of a deceased wage earner and his widow" qualify for survivorship benefits and thus the biological child is considered a child under the Act; therefore, there is no need to apply Section 416(h) to determine whether the twins were eligible under Florida's intestacy statute (30). The matter finally reached the US Supreme Court which reversed the decision of the Court of Appeals holding that the District Court's decision was correct because for a biological posthumously born child to receive Social Security benefits under the Act, the state's intestacy statute where the wage earner was domiciled must provide that the applicant meet the definition of "child," as defined in 416(h) of the Social Security Act (31).

It may be interesting to see how the legal status of the offspring likely to be conceived after the death of biological father has been perceived in other jurisdictions. In Australia, the Supreme Court Tasmania, *In re Estate of the Late K*, held that frozen embryo is entitled to acquire inheritance rights. Justice Slicer held that under the civil law the fetus has contingent legal interests which vest and become enforceable upon its live birth (32).

In Australia, in 2011, the Supreme Court of New South Wales in *Re the estate of the late Mark Edwards*, on application by wife for possession of sperm extracted from body of late husband, held that "Ms Jocelyn Edwards is entitled to possession of the sperm recovered from the body of her late husband, Mr Mark Edwards" for intended use in assisted reproductive treatment to conceive a child although there was no written consent by late husband to such use (33).

In the U.K., Mrs. Diane Blood wanted to use her husband's sperms which were collected 'shortly before her husband was certified clinically dead', in March 1995, so that she could have her husband's child. The Human Fertilisation and Embryology Authority did not allow Mrs. Blood to use the sperms on the plea that such use was in contravention of the Human Fertilisation and Embryology Act 1990 because the sperms were extracted and stored without the written consent of Mr. Blood. Mrs. Blood's request for going abroad for using the sperms was also turned down. Mrs. Blood sought judicial intervention wherein the Court of Appeal ruled that extraction and storage of her husband's sperms was illegal because it was done without written consent of Mr. Blood. The

Court, however, concluded that “Mrs Blood has the right to receive treatment in Belgium with her husband’s sperm unless there are good public policy reasons for not allowing this to happen.” (34) Mrs. Blood was, ultimately, inseminated with her husband’s sperms in Belgium and gave birth to a healthy child (35).

However, the 30th June 2016 decision of the Court of Appeal in *Mr and Mrs M v. Human Fertilisation and Embryology Authority* enabling a 72 year old woman to give birth to her own grandchild by using her dead daughter’s frozen eggs is a momentous pronouncement, reflecting a divergent approach. In this case the Human Fertilisation and Embryology Authority (HFEA) refused permission for posthumous fertilization and implantation of the frozen eggs of a 21 year old girl dying of cancer in 2011 in her 60 year old mother on the ground of absence of valid consent of the deceased, as contemplated under the Human Fertilisation and Embryology Act. The High Court of Justice, Queens Bench Division, endorsed the HFEA decision. But, the Court of Appeal, London, relying on the circumstantial evidence in the nature of conversation of the deceased with her mother and the fact that “she asked for her ovaries to be transplanted in her mother” clearly showing her intent and desire to have the baby created out of her eggs by using her mother as the surrogate, allowed the mother’s appeal setting aside the High Court’s decision and directed the HFEA to reconsider their decision in accordance with the wishes if the dead girl.. The decision reflects the need to read the deceased’s intentions and desires in an objective and humane manner, keeping in view the real-life situations, rather than insisting on the literal interpretation of the law (36).

The Israeli judicial system has moved towards liberalization from their earlier position confining the right of in vitro fertilization solely to the female partner of the deceased. In several cases, on the basis of presumed consent, the family court has granted permission to the parents to use their deceased son’s sperms to impregnate the woman who would be the legal and biological mother of the expected child. In 2007, a court allowed the parents of 19-year-old Staff Sergeant Keivan Cohen who was mortally wounded in the Gaza Strip on August 20, 2002 to produce a grandchild using their dead son’s sperm as a “sperm donation” to a single woman who wanted a baby with a known father’s identity (note that otherwise, in Israel there is no option for a known sperm donation). The child who was eventually born from this joint process is now four years old, and lives with his biological mother. The parents of the deceased enjoy limited status of the child’s grandparents, having visitation rights and also the right to provide financial support (37).

In 2009, a soldier suffering from cancer, donated his sperm while still alive. A woman was impregnated with his sperm and a child was born (38). In another case the wife of a young man who died in an accident in 2004 got his sperms extracted and stored. Subsequently, the wife adopted a new partner and gave birth to two children with him and was not inclined to use the stored sperms. The parents of the deceased son wanted to inseminate another woman with his sperms. The widow objected to their request. The District Court ruled that half of the 19 tubes of frozen sperm belonged to the parents of the deceased. The widow appealed against the decision to the Israeli Supreme Court. The matter was hotly contested by the parents but the Supreme Court rejected their claim holding that Grandparents’ rights do not extend to the right to demand the birth of grandchildren (39).

## Discussion

### **1. Right to posthumous Reproduction**

It is only the person who dies, not the personhood. The “deceased does not forfeit all of his or her human status upon death” (40). The dead may continue to live through his/her reproductive material. Article 16 (1) of the Universal Declaration of Human Rights (UDHR), adopted by the United Nations General Assembly on 10 December 1948 states “Men and women of full age, without any limitation due to race, nationality or religion, have the right to marry and to found a family”. Article 12 of the European Convention on Human Rights (ECHR), entered into force on 3 September 1953, asserts “Men and women of marriageable age have the right to marry and to found a family, according to the national laws governing the exercise of this right” The similar right has been recognized under Article 12 of the Human Rights Act, 1998, of the United Kingdom. Furthermore, Article 8 (1) of the European Convention affirms “Everyone has the right to respect for his private and family life, his home and his correspondence.” Article 23 (2) of the International Covenant on Civil and Political Rights (ICCPR) proclaims “The right of men and women of marriageable age to marry and to found a family shall be recognized.” As such, right to beget and bear children is an internationally recognized human entitlement. The U.S. constitution does not explicitly recognize a right to reproduce. However, the US Supreme Court has consistently acknowledged a person’s fundamental right to procreate, child rearing, contraception and family relationship (41, 42, 43, 44, 45). “The philosophical justification for posthumous reproduction stems from a belief that having biological children is a human right. The right to reproductive choice

derives from individual free will and consciousness that transcends religious and government authority. Denying the right to procreation is a sentence, perhaps closest in nature, to involuntary sterilization or the death penalty" (46).

Any opposition to one's right to posthumous reproduction appears paradoxical per se. In a world where right to receive organs and tissues from the deceased by others has been recognized as a normative practice how can one argue that a person cannot use his/her own gametes for fulfilling his/her desire. Resistance against posthumous reproduction, it seems, is rooted in archaic mindset reflecting taboo and unwarranted moral paternalism. It is the inherent right of every individual to exploit scientific promise to address his/her problems and to pursue happiness as long as it does not affect the rights of others. Posthumous reproduction in that context is a blissful scientific advancement. As such, prohibition on post mortem fecundation in most of the States of Europe is not intelligible.

## **2. Property rights in gametes and embryo**

Property rights in human body and its materials has been a debatable issue since long. "No other rule of law can claim as macabre a passage through history as the common law rule that there is 'no property in the human body'. Slavers, grave robbers, grieving widows, freak show exhibitors and harvesters of body parts have featured prominently. The rule is only now coming in from obscurity and assuming growing importance. New uses for the human body, driven by medical advances in IVF, stem cell research, cloning, gene therapy and other like areas, require that we re-examine the efficacy of this rule in its application to modern circumstances" (47). Although there are heterogeneous judicial approaches with regard to moral status of the human gametes and embryo ranging from "property" to "seed of life" the Courts in several jurisdictions have held that the parties are entitled to exercise ownership rights on the gametes and embryos and take decisions with regard to their disposal as their property. In the U.S.A., in *Davis v. Davis*, the Tennessee Supreme Court, the first state supreme court to deliberate on the issue of embryo disposition, held, "[embryos] are not, strictly speaking, either 'persons' or 'property,' but occupy an interim category that entitles them to special respect because of their potential for human life." But, the Court held that the parties were entitled to exercise ownership rights on the embryos and take decisions with regard to their disposal (48). In *Hecht v. Superior Court*, the California Supreme Court ruled that a decedent's frozen sperm were a distinct category of property in which "decedent had an interest, in the nature of ownership, to the extent that he had

decision making authority as to the sperm within the scope of policy set by law." The Court allowed a probate court to assume jurisdiction over the sperm as property of the decedent at the time of his death (49). Supreme Court of British Columbia, Canada, in *J.C.M. v. A.N.A.*, in 2012, held that the sperm "should be treated as property and divided between the claimant and respondent as such." (50) In *C.C. v. A.W.*, in a dispute involving four residual embryos after *in vitro* fertilization, the Canadian Court, in 2005, decided in favour of A.W. holding that the "remaining fertilized embryos remain her property. They are chattels that can be used as she sees fit." (51) In *Parpaliak v. CECOS*, the French Court while determining the fate of deceased's sperms refused to treat them as an ordinary moveable property describing them as "the seed of life" but impliedly recognized the property rights in the gametes by granting their custody to the deceased husband's wife (52).

The Court of Appeal of England and Wales in *Yearworth and others v North Bristol NHS Trust* while dealing with the loss of preserved and stored sperms due to fall of liquid Nitrogen below the required level unanimously held that the sperms are property for the purposes of the law of negligence (53).

The Supreme Court of Queensland, Australia, in 2000, In the matter of *Gray* refused to recognize property rights in human gametes. While rejecting the application of the wife for post mortem extraction of sperms of her husband who suddenly died in his sleep the Court observed, "It appears that the underlying principles of law are that those entitled to possession of a body have no right other than the mere right of possession for the purpose of ensuring prompt and decent disposal. The prohibition on interfering with a body sanctioned by the possibility of criminal prosecution indicates that to remove part of the body for whatever reason or motive is unlawful" (54). In a diverse opinion, in 2011, while examining the property rights in human gametes, the Supreme Court of New South Wales, in *Re the estate of the late Mark Edwards*, after a thorough analysis of various judicial decisions across the world, observed, "Subject to a consideration of various discretionary aspects to which I am next to turn, in my view Ms. Edwards is the only person in whom an entitlement to property in the deceased's sperm would lie. The deceased was her husband. The sperm was removed on her behalf and for her purposes. No-one else in the world has any interest in them. My conclusion is that, subject to what follows, it would be open to the Court to conclude that Ms Edwards is entitled to possession of the sperm" (55).

Perhaps the A's mother provides the most candid description of their status: "I have absolutely no

doubt in my mind that, as far as A was concerned, her eggs held a life force and were living entities in limbo waiting to be born (56).

### 3. Consent

The European Society of Human Reproduction and Endocrinology (ESHRE) 2006 guidelines suggest that PMSR should be offered only if written consent has been given by the deceased person, thorough counselling has been received by the surviving partner before taking the decision and a minimum waiting period of 1 year has been imposed before a treatment can be started (57). These recommendations, at times, may not be consistent with the real-life situations and larger human interest. The purpose of consent is to promote autonomy of the individual, not to obliterate his/her biological expressions and desires. The validity of consent needs to be determined in a candid and realistic manner, under the prevailing circumstances. Consensual paradigms in case of sudden and unexpected death and the urgency involved in the post mortem gamete retrieval have to be pragmatic. For insemination of a remarried woman by the sperms of her deceased husband or implantation of the embryo created by her ova and sperms of her deceased husband the consent of her deceased as well as the present husband seems necessary. In the event of absence of the deceased husband's consent his intent must be determined by the relevant circumstances before insemination/implantation. The Courts across the world in this regard have adopted a pragmatic and realistic approach by relying on the intent of the deceased as reflected through accompanying circumstances.

In this context, the French court's verdict in *Parpaliux v. CECOS* provides a positive and enlightening analysis. Alain Parpalaix who was diagnosed with testicular cancer, deposited his sperms in a fertility centre in France without specific instructions regarding their use, before being subjected to chemotherapy. Alain could not survive but he married Corrine just two days before his death. Corrine claimed access to Alain's sperms in order to conceive his child but the fertility centre denied their access to her. Corrine sought judicial intervention. The French court, in the absence of a written contact, examined the associated circumstances. The fact that Alain deposited his sperms and chose to marry Corrine just two days before his death demonstrated his intention that Corrine should carry his child. This was further supported by Alain's parents who testified that he wanted Corrine to be the mother of his child (58).

In Australia, in 2011, the Supreme Court of New South Wales in *Re the estate of the late Mark Edwards* on an application by his wife Ms Jocelyn Edwards for possession of sperm extracted from

the body of her late husband, despite the absence of written consent by her late husband for such use, issued a declaration that she was entitled to possession of the sperm recovered from the body of her late husband for intended use outside New South Wales to conceive a child. In the absence of written consent, the Court relied on the wishes of Mr. Edwards conveyed to his wife in a conversation on the Valentine's Day in which he said, "If something happens to me I would want a part of me to be here with you. Our baby will be a part of us - our legacy even after we are both gone. She will be the bond that unites our families. The bond between [their two children]. If we find out I have cancer I want to make sure we have our baby before I am unable to have one, before I do any chemo. Please promise me you will still have our baby" (59).

Based on the parental wishes of becoming grand parents, in the absence of written consent, the physicians in Israel have retrieved sperms from the body of the deceased and the Courts have allowed impregnation of the unrelated woman to produce child although such a course is not supported by any legislative enactment. This reflects Israel's general pro-natalist sentiment founded in the Jewish belief that procreation is a fundamental commandment within the Jewish tradition, "be fruitful and multiply."

The 30th June 2016 decision of the UK's Court of Appeal in *Mr and Mrs M v. Human Fertilisation and Embryology Authority* enabling a 72 old woman to give birth to her own grandchild by using her dead daughter's frozen eggs also reflects the need to read the deceased's intentions and desires in an objective and humane manner keeping in view the real life situations rather than insisting on the literal interpretation of the law (60). I agree with the author when she says: "I believe that conditioning the posthumous use of gametes or embryos on the ability to prove that the deceased wanted posthumous children gives the legal system undue authority to determine a person's genetic legacy. I argue that biological continuity is a human right that neither society nor the government has the right to negate. A more logical assumption is that an individual seeks genetic continuity unless s/he says or acts to the contrary. I see carrying on a person's posthumous genetic legacy as the essence of the sanctity of life and an act of dignity" (61).

### 4. Parentage and rights of the child

The question of parentage of the child borne out of posthumous reproduction is a complex issue. Two men, the genetic and the nurturing may be treated as fathers and three women, genetic, gestational and nurturing may be assigned the motherhood. The time of harvesting the sperm or ovum i.e., before or after the death, is not as vital a

consideration as the genetic origin of the offspring. Genetic linkage provides the surest way of establishing parentage and the person's biological identity. In the UK, the Human Fertilization and Embryology Act, 2008 (HFEA) mandates that a man whose sperm has been used after his death must be considered the father of the child only if he has given written consent (and did not withdraw the consent) to use his sperm after death and the woman "has elected in writing not later than the end of the period of 42 days from the day on which the child was born for the man to be treated ..... as the father of the child". However, the laws in other countries are not so explicit and declaration of paternity solely on the basis of sperms, in the absence of such legislative provisions, may create conflict of interest and disputes among various stakeholders in the matter of inheritance and social security benefits. In the event of successful implantation and birth, the legal rights of the child and his/her mother, including the paternity of the child and his/her right of inheritance and the right to marry due to possibility of consanguinity may lead to dispute. In the USA, Section 707 of the Uniform Parentage Act deals with parental status of deceased individual but the Act leaves several vital dimensions of posthumous reproduction unaddressed. In Canada, the Uniform Child Status Act (2010)<sup>2</sup> contains provisions regarding the parentage of posthumously conceived child and serves as a suggestion for the harmonization of laws between provinces but the declaration of parentage is subject to the orders of the Court which may only be granted if the Court is satisfied that the deceased's "human reproductive material" was used and that the deceased consented in writing (and did not withdraw such consent) to be the parent of a child conceived posthumously. "Although the proposition that after-born children should be legally recognized as the children of their deceased parents is broadly supported, no consensus has emerged concerning the rights of such children to inherit or to claim support from their deceased parents." and "considerable disparities remain in the approaches taken by different jurisdictions to the rights of after-born children (62).

The Supreme Court of Queensland, Australia, in 2000, In the matter of Gray while rejecting the application of the wife for post mortem extraction of sperms of her husband declined to exercise the Court's discretionary powers in favour of the applicant, inter-alia on the ground that the "interests of any child born as a result of the procedure must be of particular importance in the exercise of the discretion. I cannot see how it can be said that the interests of such a child will be advanced by inevitable fatherlessness. The very

nature of the conception may cause the child embarrassment or more serious emotional problems as it grows up. More significant, because the court can never know in what circumstances the child may be born and brought up, it is impossible to know what is in its best interests" (63).

Paternity "plays an important role in shaping the child's identity and in fashioning the familial relationship between the child and her relatives, including the husband's parents, his siblings or his other children" (64). Fairness and equity mandates that the rights of the child borne out of husband's posthumous retrieval of sperms should not be affected due to presence of the subsequent husband as long as the child's claim is confined to the assets of his/her genetic father. "The interests of all these parties — the deceased, the widow, the child — as well as the broader social interest, must be weighed if we are to decide on the ethics of posthumous reproduction" (65). Scholars believe that "lack of legislative activity is unfair to the innocent children born into this circumstance. It is time for politicians to step forward into this political hotbed and make conscious, thoughtful decisions regarding the status of these children" (66) and that "the posthumous child and the rights and responsibilities relating to such a child, are directly related to the fundamental right to procreate, thus statutes must support rather than prohibit posthumous conception" (67). As such, the law needs to be evolved to equitably define the legal entitlements of the posthumously conceived children and the children conceived during the life time of the parents.

### **5. Way Forward**

Contemporary world order is founded on human dignity, scientific promise and the rule of law. Human dignity contemplates compassion and beneficence; scientific promise envisages evolved and awakened minds, free from bias and taboo; rule of law mandates supremacy and spirit of law based on reason, logic and equity. All human endeavours need to be tested on the touchstone of these core values. Posthumous reproduction has been available for almost thirty years but it continues to be utterly unlegislated. Owing to legislative inadequacy the aggrieved parties are constrained to seek judicial intervention. But, the Courts are no substitute for legislature. "The possibilities of posthumous reproduction pose fundamental questions about the significance of reproductive material, the meaning(s) of autonomy in the context of reproductive decision-making, and the balancing of interests between the living and the dead" (68). "Practical, comprehensive, flexible, and standard laws will need to be developed to provide the necessary guidelines to give parents, doctors, and fertility clinics/sperm banks a reasonable

opportunity to provide for posthumously conceived children" (69). In the event of dispute between the partners with regards to use of gametes or embryos a balance-of-interests approach may, at times, be a valid option.

Ability to conceive children by those who are dead is a profound scientific achievement. Although not explicitly recognized in law, and forbidden in most of the European countries, the judicial decisions reflect a positive attitude towards continuance of the dead in the form of his/her offspring. With advancing biotechnology rights of the dead have come to the fore and the law has to keep pace with the emerging scientific promise. Cultivators of law ought to appreciate that posthumous reproduction is a highly personalized expression of the emerging scientific promise and specific provisions need to be made in the law to ensure timely retrieval of gametes from the dead, without undue legal hurdle. "There is perhaps no greater way that the living can honor the dead than by safeguarding the pre-death intentions of those who are now deceased, in a matter as fundamental as procreation" (70). "In a society that values the individual's rights of privacy and procreation so highly, where questions on abortion have caused severe internal strife, where single-parents abound, and where so many millions of Americans face trouble conceiving a child, it seems unthinkable that we would unilaterally restrict the rights a person has in his or her own reproductive material and in the freedom to decide when and how to have children. Instead of being scarred for life, these children could certainly grow-up better adjusted than "the kid next door," embraced by the love of a parent who went to great lengths to have them and the knowledge that they were unquestionably wanted" (71).

## Conclusion

Posthumous reproduction is a spectacular expression of advancing biotechnology bringing hope and joy to many but its concretization is marred by ethical ambiguity and legislative inadequacy. Several issues such as right to posthumous reproduction, moral status of the human embryo; nature of the deceased's rights in gamete or embryo; consent of the deceased; respectful treatment of the dead body; rights of the widow or widower; offspring's identity, parentage consanguinity, legitimacy, rearing, social security benefits, inheritance rights and a host of others continue to be controversial. Many jurisdictions in the world, claiming to be a part of scientific social order, display a highly restrictive and anti-futuristic approach as nearly half of the Europe forbids posthumous reproduction. Incapacitation due to PVS, sudden and unexpected death and the urgency

involved in the postmortem gamete retrieval call for due consideration while dealing with the issue of consent of the deceased. Consensual paradigms in such situation have to be pragmatic. Courts across the world have ruled that a person continues to have rights in his/her gametes and embryo after death and these rights can be exercised either through the deceased's will or intention. The earlier laws of inheritance based on the notion that a person must be alive at the death of his or her benefactor, or in the womb and later born alive, are not consistent with the emerging scientific promise and human aspirations. Specific laws based on equity and biological proximity need to be evolved with regard to legal entitlements of the posthumously conceived children vis a vis the children conceived during the life time of the parents. Undoubtedly, the 30th June 2016 decision of the UK's Court of Appeal enabling a 72 old woman to use her dead daughter's frozen eggs is an oasis in the desert of ethical and legal ambiguity. However, the courts of law are no substitute for legislative wisdom. The issue of posthumous reproduction needs to be adequately legislated by evolving comprehensive, pragmatic and humane legislative policies in order to ensure spontaneous and meaningful application of this rewarding reproductive technology.

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## Palatal rugae pattern identification to determine family lineage in Minangkabau, West Sumatera, Indonesia

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### Abstract

**Background:** This paper discusses palatal rugae patterns and their contribution in the identification of individuals and the determination of family lineage in West Sumatera, Indonesia. Identifying an individual is very useful for postmortem examination, for personal, social and legal purposes. The most common techniques used in this context are dental records, fingerprint and DNA comparisons. However, these methods cannot be used under certain circumstances. But interestingly palatal rugae patterns are preservable because they are stable, and impervious to disasters and hostile conditions and therefore can be used as alternative human identification techniques. This paper argues that the study of palatal rugae (rugoscopy) not only help reveal a person's identity but also help determine their family lineage.

**Objective:** The present study was carried out to ascertain whether there are any hereditary patterns in the palatal rugae patterns of the mother, father, and the offspring in one family.

**Method:** This is a cross sectional study of 48 samples consisting of 12 families in *Luhak Nan Tigo*. The parents and offspring (son or daughter) of each family were randomly selected. Palatal rugae impression was recorded using alginate, while palatal rugae patterns were noted and recorded. *One Way ANOVA* test (SPSS 17) was used for statistical analysis.

**Result:** The study shows that there is a significant similarity in curved, wavy, and straight rugae patterns ( $p > 0.05$ ) as well as in primary, secondary, and fragmented rugae based on the family tie between the father, mother, sons and daughters of

the *Minangkabau* ethnics. Unilateral and circular rugae tests are insignificant ( $p < 0.05$ ).

**Conclusion:** This is a cross sectional study whose results are only based on 48 samples consisting of 12 families, therefore further studies are needed with a larger sample quantity. The results of this study indicate the role of factors in palatal rugae patterns.

## Introduction

In the last few decades, Indonesia has dealt with more than 400 natural disasters of which floods, fires, typhoons and landslides are the most common. In addition to this, disasters such as earthquakes, tsunamis and volcano eruptions also occur on a yearly basis.<sup>1</sup> These natural disasters have caused the death of tens of thousands of people in West Sumatran, one of the disaster-prone areas in Indonesia. Sadly however, many of these victims were not identified due to the lack of financial or material means to conduct identification procedures.

In order to issue the death certificate of an unknown/unidentified deceased person, or for personal, social and legal reasons, DNA test, retina, fingerprints and dental characteristics are the most common techniques referred to in forensic science. However, many of these methods may not be totally effective or conclusive.<sup>2</sup> Hence the need for the study of palatal rugae as an alternative method for the scientific identification of individuals. Palatal rugae can be very useful for the identification of victims of mass disasters such as earthquakes, landslides and tsunamis, etc., crime investigations, ethnic studies, and in the identification of decomposed and disfigured bodies as a result of drowning, burns, and accidents.<sup>3</sup>

Rugoscopy, cheiloscopy, bite marks, tooth prints, radiographs, photographic study, and molecular methods are various methods employed in forensic odontology. When these methods of identification are unavailable, however, palatal rugae may be considered as an alternative source of information to facilitate the identification process.<sup>2</sup> There are several classifications of palatal rugae. But the most frequent used is the classification given by Thomas and Kotze,<sup>2</sup> which classifies Palatal rugae in three categories based on their length: Primary rugae (more than 5 mm in length), secondary rugae (3-5 mm in length) and fragmented rugae (<2 mm in length).

The patterns of the rugae are classified into curved, wavy, straight and circular types. Straight patterns have a direct course from the point of origin to their insertion in a straight line. Curved patterns have a crescent shaped pattern with a mild curvature. Wavy rugae are serpentine in shape. Rugae with specific continuous ring type

morphology are classified as circular. Unified rugae are united either in their origin or in their insertion giving a forked appearance. These are the patterns involved in this study conducted to assess the association of palatal rugae patterns among family members of the *Minangkabau*, a subgroup of the *Deutro Malay* ethnic, which consist of *Aceh, Malay, Minahasa, Bugis, Makasar, Sasak, Bali, Java, and Minangkabau*.<sup>5</sup>

## Method

This research was conducted in *Luhak Nan Tigo* located at *Guguak, Situjuh, and Tanjung* Sub-districts in the District of *50 Kota, Tanjung Baru* subdistrict situated at the District of *Luhak Tanah Datar*, and in *Baso, Banuhampu, and Tanjung Raya* Subdistricts located at the District of *Luhak Agam*. The study was conducted from January to June 2017. A total of 489 palatal rugae were observed in 48 palatal rugae models from 12 families. The study was conducted with the door to door system in each subdistrict. Prints of jaws of the respondents were obtained after the research was explained to them and informed consent was provided. The Committee of the Research Ethics of the Faculty of Medicine, Andalas University, with regard to the protection of human rights and welfare in medical health research has carefully reviewed the research protocol with Ethical Clearance number 073 / KEP / FK2017 on March 2nd 2017.



**Figure 1:** Delineation of palatal rugae pattern on dental casts

Maxillary impression was done using irreversible hydrocolloid alginate. The impressions were cast using dental stone type 3. The jaws were printed using irreversible hydrocolloid material i.e., alginate. The result of the jaw printing was cast using dental stone type 3. The maxillary cast analysis was performed single-blind by two different observers to get accurate measurements and reliable results, then classified based on Thomas- Kotze and Sunita Kapali classification method. Observers are dentists of the Faculty of Dentistry University Andalas who have good eyesight, understanding and perception.

The same procedure was used in length measurement and observation of palatal rugae patterns. The Result Measurement of each observer was tested using Technical Error of test Measurement (TEM), intra-observer and inter-observer. TEM test was performed on 20 samples of maxillary cast having primary rugae and secondary rugae.

## Results

This study was conducted to assess the similarity of palatal rugae patterns between family members, i.e., father, mother, sons and daughters of the *Minangkabau* ethnic. A total of 489 palatal rugae were observed in 48 palatal rugae models from 12 families. *One Way Anova* test results of curved, wavy, and straight rugae are  $p > 0.05$ , which indicates that there is a significant similarity in the shape patterns. The results of the unilateral and circular rugae form test are  $p < 0.05$ , which indicates there is an insignificant similarity in the patterns of uniform and circular form. The results of the primary, secondary, and fragmented rugae test are  $p > 0.05$ , indicating a significant similarity in the palatal rugae patterns based on the family tie between the father, mother, sons and daughters of a *Minangkabau* family. The average number of palatal rugae and  $p$  value in this study are as follows:

**Table 1:** Average Amount of Palatal Rugae

Rugae Pattern		Mothe r	Fathe r	Son	Daugh ter	P
Sha pe	Curve	2,92±1 ,67	4,08±1 ,92	3,08±1 ,78	2,92±1 ,37	0, 28
	Wavy	2,92±1 ,67	3,42±1 ,92	4,05±2 ,19	4,75±2 ,52	0, 11
	Straight	2,00±1 ,70	1,75±1 ,28	2,50±1 ,44	1,83±1 ,11	0, 56
	Unified	1,50±1 ,16	0,50±0 ,90	1,08±0 ,99	0,50±0 ,67	0, 03
	Circular	0	0	0,08±0 ,28	0,42±0 ,66	0, 02
Size	Primary	7,25±1 ,81	7,83±1 ,26	8,33±1 ,07	8,17±1 ,26	0, 24
	Second ary	1,67±1 ,37	1,83±1 ,40	2,17±1 ,74	1,75±1 ,13	0, 83
	Fragme nted	0,42±0 ,66	0,08±0 ,66	0,75±1 ,71	0,05±0 ,90	0, 47

## Discussion

Sumatra is the second biggest island in Indonesia after Java Island, and the sixth biggest in the world. Its Western coast, known as *Sumatera Barat* (West Sumatera), is home to the *Minangkabau* people whose culture (*budaya Minang*) is handed down in regions such as *Luhak Nan Tigo -Luhak Agam, Luhak Tanah Datar and Luhak Lima Puluh*.<sup>6</sup> This is the reason why the research was conducted at these locations.

Palatal rugae are irregular, asymmetric ridges of mucous membrane of the incisive papilla and the anterior part of the median palatal raphe, located behind the maxillary central incisor teeth.<sup>7</sup> Harrison Allen was the first to suggest the use of palatal rugae as a method of personal identification in 1889. But it was not until 1932 that the term "palatal rugoscopy" was brought up by Trobo Hermosa, a Spanish investigator.<sup>2</sup> Palatal rugae normally begin to form towards the third month of prenatal life. Palatal rugae patterns are unique. The uniqueness of palatal rugae patterns may facilitate their use in postmortem identification. This is due to the fact that palatal rugae is stable and can resist postmortem decomposition changes for up to 7 days after death and can withstand great thermal insults like third degree burns.

Because palatal rugae is protected by the tongue, dentition, and cheeks, it can resist other forms of massive trauma.<sup>8</sup> The identification of a person through DNA examination has limitations such as contamination and high cost, while the use of palatal rugae can provide ideal parameters because of its uniqueness, stability, resistance, and simple and inexpensive methods. The potential use of palatal rugae in forensic identification has advantages because it is sufficiently able to discriminate between individuals as no two palatal rugae configurations are alike. Certain rugae patterns are specific to a particular population and may also have utility in population differentiation.<sup>9</sup>

Observing rugae patterns, Selvamani et al found that wavy patterns are common in males and females, followed by curved and straight patterns. Circular patterns are very few in number but significant ( $P = 0.05$ ).<sup>10</sup> Some scientists claim that environmental factors are unlikely to affect the formation of rugae and believe that its patterns are determined by genes. Genes influence the orientation of the collagen fibers during embryogenesis and govern rugae patterns in different populations.<sup>11</sup> Observing the length of rugae, it appears that primary rugae are most prevalent than secondary and fragmented rugae.<sup>12</sup> Examining the types and origins of palatal rugae according to the Lysell classifications, the study of Beatrice's (2013) showed that the palatal rugae of males is different from that of females. Primary and Secondary rugae are all found in males compared to females, whereas fragmented rugae are more common in females than males. Primary rugae derived from raphae are found in males, whereas medial origin is found in many women, the study concludes.

Another study was carried out by Patel to assess whether there is any hereditary pattern in palatal rugae patterns between the offspring and their parents. The study showed that there is a positive

correlation of palatal rugae patterns between the offspring and either of their parents.<sup>13</sup>

Finally, a study by Indira suggests that the comparison of palatal rugae patterns among family members also shows different patterns. Although in one family few forms were similar, rugae patterns are not identical. This means that the role of heredity is uncertain in determining the orientation of rugae patterns.

## Conclusion

The patterns of palatal rugae in *Minangkabau* family has the same number of rugae based on the significant shapes i.e., curved, wavy, and straight, and based on the significant length i.e., primary, secondary and fragmented. Because the results of this study are rather partial as they rely on a data consisting of only 48 individuals from 12 families, a more detailed follow-up study is needed with a larger sample size to reach an ultimate conclusion. The results of this study indicate that there are hereditary factors in the rugae patterns, which makes them very useful for the identification of individuals. Chemicals, disease, heat, and trauma cannot alter palatal rugae patterns. Cheeks, lips, tongue, buccal pad of fat, teeth and bones protect palatal rugae from trauma and high temperature. Although we acknowledge that the limited number of families studied does not allow us to reach a final deduction, it is important to note that rugae patterns may be used as genetic markers for further research. We hope this research is a contribution of data in the field of forensic odontology on individuals, especially ethnics of the *Minangkabau* and the *Deutro Melayu*.

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## Conflict of Interest:

The authors confirm that there are no conflicts of interest to disclose.

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