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EDITORIAL

Life After Covid19: The New Normal

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"If you hear of an outbreak of plague in a land, do not enter it; if the plague breaks out in a place while you are in it, do not leave that place", reported by Sahih Al-Bukhari. This was the phrase quoted by Prophet Muhammad 14 centuries ago concerning both in disease spread and prevention. The relevancy of this statement is now widely seen and surge by the social media in a hashtag of "stay home" on an international level due to pandemic of COVID-19 disease.

The Year 2020 is supposed to be a turning point for Malaysia as she was promised to become a developed nation by then. However, the dream turned to a nightmare with many unprecedented changes in the political scenario and the major health challenge facing the outbreak of virus COVID-19 disease, the official name as announced on 11th February 2020, which stands for the coronavirus disease that was discovered in 2019.

Malaysia recorded the first confirmed cases on January 25, 2020. These were visitors from Guangdong and Wuhan in China, which most experts agree was the source of the original outbreak. It was only two days before, on 23rd January 2020, Wuhan had been placed into full lockdown of her population and following the government's acknowledgement of life-threatening epidemic.

By 28th February, Malaysia had 25 cases of COVID-19 infection, with two reported being foreigners who had respectively visited Japan, Indonesia, and Italy. As of 16th March, there were already 125 new COVID-19 cases, raising the tally of infections in the country to 553.

On 11th March 2020, The World Health Organization (WHO) has officially declared the outbreak of COVID-19 a pandemic, after the disease caused by the new coronavirus spread to more than 100 countries and led to tens of thousands of cases within a few months.

With this first outbreak, the government quickly implement the national lockdown, known as the Movement Control Order. The first phase of Movement Control Order (MCO-1) was imposed by Malaysia under the Control of the Spread of Infectious Diseases Act 1988 and the Police Act 1967, effective from 18th to 31st March.

Under this order, all places of learning, from kindergartens to higher institutes and vocational schools were directed to be closed for the duration of the MCO, with higher education institutes transitioning to online lectures. All mass gatherings in the country, including religious, sporting, social, and cultural events, were directed to be postponed or cancelled. All places of worship, and businesses excluding essential services, were closed as well. Only essential services were allowed to operate such as medical, security, postal, electricity, and other essential services for the community (with strict Standard Operation Procedure – SOP).

The first phase of MCO was a means through which the government established a form of mitigation, of "flattening the epidemic curve", which was basically to lower the spike in infected numbers that would overwhelm the healthcare system. Aimed at breaking the COVID-19 chain of infection.

The MCO-1 which was original to have expired on 31st March 2020, was extended further two weeks until 14th April 2020 (MCO-2) after COVID-19 cases kept on rising.

The focus of this MCO-2 was to break the chain of transmission by focusing on target groups identified as the source of the spread of the disease. This had resulted in positive cases being brought under control at 7 per cent, which is below the benchmark of 7 per cent set by WHO. The fatality rate recorded was also low, at 1.6 per cent compared to 5.8 per cent at the global level. The recovery rate at 43 per cent (1,830 cases) was encouraging and was more than the number of new positive cases. The number of new positive cases had also shown to decline.

The Ministry of Health (MOH) has described the implementation of the MCO-1 and MCO-2 following the COVID-19 outbreak as successful in producing positive results. However, based on advice from MOH and medical experts, the government had decided to extend the MCO. This was to step up checks along the country's borders to prevent illegal immigrants from slipping in through "rat routes" and bringing the virus into the country. The MCO-3 was extended for another two weeks, from 15th to 28th April. This action was in line with the view of WHO, which suggested that countries should not end the Movement Control Order too early, and has happened in several countries, the spread of the disease increased again when the order was lifted.

During MCO-3, certain areas (red spot areas) which recorded higher local transmission implementation of the "enhanced MCO" (MCO-E) were implemented. This had encouraging outcome as it achieved the goals of ramped-up case-detection and limiting the local transmission set out for the two weeks.

At this time of writing, Malaysia is already extended the MCO to MCO-4 with effect from 29th April to 12th May 2020.

The war on COVID-19 is not over yet and we have not won the war yet, neither have we lost the war. We are still in the middle of the COVID-19 pandemic. The extension of the MCO is necessary to prevent a potential immediate second wave.

The most uttered question now is when will this be over and when we can only return to our old way? Can life return to normal after the MCO ends?

These can only happen if the virus dies out due to effective lockdowns all over the world or tones down to become like seasonal influenza. We can only be "safe" if we managed to find a "miracle cure" that can treat large numbers of people and reduce the severity of the disease. We hope the development of a highly effective vaccine that can be mass-produced and distributed to large volumes of the population to give us immunity. However, all these prospects are highly unlikely to happen soon. Thus, there is no immediate return to the old ways.

We would be living in a new reality – 'post-corona virus reality' and we have to learn how we need to change, how we can adapt and survive this reality. This will be our "new normal" way of life. It could be a blessing in disguise – a pause in our busy lives to stop and experience this family bonding. We can start appreciating the things we have and spend quality time with the ones that matter most to us.

A reminder to all of us that the little things we took for granted. We do not appreciate what we have until it is gone – "Freedom is like air when you have it, you do not notice it". The truth is, we do not know definite answers too many questions. What we can do in the meantime is reflect on what we do know. And as the great physicist Richard Feynman said, "What is not surrounded by uncertainty cannot be the truth".

The COVID-19 pandemic has changed the way we live.

May Allah bless us all.

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REVIEW ARTICLE

Biological Clock! Separate Day and Night

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Keywords: biological clock, diseases, classical data, modern studies, night, day

ABSTRACT

Many diseases occur at certain times and after a specific process. Their treatment also needs to be done at a certain time. This is because external factors are among the causes of many diseases. Some seasonal times and environments make up diseases. In parallel with the type of illness, their treatment also requires a specific process and period. Treatments not made at the right time and in the right place do not yield results. Many factors affect human health, from his/her environment to the outside atmosphere, such as planets, sun, moon, and day and night. There are two hours of the day, day, and night, which we call biological hours for the treatment of diseases.

INTRODUCTION

It is known that there are a biological clock and circadian rhythm in line with the structure and environmental relationship of the human body. The biological clock is connected to all dimensions of human life. In this respect, the process of staying healthy and knowing the biological clock in the treatment of diseases and the treatment during these hours are the most significant factors in reaching a lasting result[1].

There are individual and orderly functioning in the physical and psychological functions of generally living beings, particularly humans. This is a phenomenon that surrounds the whole body and manages it with all its details. The biological clock happens in this natural control and timer

system. All phenomena and developments, such as the change and development of plants and the life cycle of animals, are directed, shaped, and happened by the biological clock, which is linked to its natural structure. Thanks to the biological clock, which is very important for the human body, the whole system works, working of the cells is regulated; activities such as body temperature, hunger, sleep always work according to this order. The proper functioning of the biological clock is essential for all organs of the body to function correctly and be healthy[2].

The findings of the studies on the effect size of age, gender, ethnic, genetic, and other factors in shaping the biological rhythm[3] showed that each of these factors could not have a direct effect just to shape the outcome itself or to connect a specific reason. For example, when the cognitive process is discussed, research findings examining the relationship between the biological clock and cognitive processes are contradictory. These contradictory findings arise from the nature of the subject. Indeed, Liu's research showed this[4]. According to him, both biological clock and cognitive processes are affected by many factors, genetically and environmentally. Various factors may affect circadian rhythm and cognitive processes simultaneously and at different rates. Therefore, according to the research conducted by Crnko et al., it seemed very difficult to keep all of these factors under control[5]. This makes it difficult to determine the biological clock.

The effectiveness of internal and external factors in shaping the biological clock, external factors are more active here. According to researchers such as Paganelli et al., Liu and Chang, the internal clock was more driven by the influence and contribution of external phenomena[6, 7].

External Factors and Biological Clock

According to Liu and Chang, study seasons, which are an external factor, influence the physiological and spiritual dimensions of people[7]. This situation affects as well as healthy people, also people with health problems more preponderantly.

The contribution of the season, which is the manifestation of a solar cycle as an external factor, to human health is accepted by researchers such as Meesters et al.[8]. According to similar studies[9], seasonal environment, birth rate, and sperm count are influential in pneumonia, bronchitis, and the influenza epidemic. In some places and situations, the change in air temperature can have fatal consequences.

In addition to the seasonal effect of the sun's cycle, several researchers have suggested the impact of the moon's motion and cycle on the Earth, livings, and human beings[10].

Due to the heterogeneity of samples related to the diversity, environmental and chronobiological conditions of species, the analysis and comparison of the lunar cycle rhythm and time are not precise, research on the interaction of circadian and lunar cycle times develops an exciting and unique perspective on the coordination between different timing mechanisms[11].

Seasonal changes and phenomena, findings of research on the lunar cycle, reveal the relationship and effect of the Moon and the livings in the world[12]. The results of Reinberg et al. study suggested that the same biological cycle proliferation observed in some plants and aquatic animals may be preserved among various species, including Homo sapiens[13]. As a matter of fact, according to Yousfi et al., the lunar cycle is one of the main factors of variable human psychology[14].

The relationship between the moon and living was the centre of interest for the classical Muslim physicians, and they considered this connection in their treatment[15]. For example, Akshamsaddin (d. 1459), who was Conqueror Sultan Mehmed's teacher and doctor, advised his patients to take drugs for medical purposes on an empty stomach every morning first new fifteen days of each month, that is, in the first half of the month[16]. Also, Al-Biruni (d. 1061), a philosopher and doctor, and Al-Kindi (d. 866), a philosopher and doctor, said that operations should be performed according to the cycle of the Moon[17]. According to Ibrahim Hakki, who is a medical scientist and from Erzurum (d. 1780) in the first half of the month, the brain tissues of living things increase, and in the second half, it decreases[18].

In Muslim medical studies in the classical period[19], it is accepted that a certain period, which is shaped by the effect of planets, sun, and moon on the Earth, is the most appropriate time for the functioning of the human physiological structure. This is called the natural rhythm of the biological clock, according to modern medical data[20].

The biological clock shaped by the influence of planets, sun, and moon is also under the control of day and night. Certain times of both night and day have a positive-negative effect on human physiology. In this respect, the classical period physicians have emphasized that the treatment should be done in the last third of the night to obtain positive results in terms of health. However, performing this treatment should be in the first part of the month (first fifteen days), which includes phase after the full moon (this is the last fifteen days for surgery). According to these data, the time zone (biological time), which is suitable for the treatment of diseases, is the time when the night ends (Zodiacal light) and the time when the sun is about to sunset. It is also necessary to consider the variability of this period according to seasons and regions.

The biological clock, which is the most critical factor for the treatment of human life, health, and diseases, is found two times in a day as day and night, within 24 hours of the day. In this case, the time of the biological clock changes continuously in the day and night cycle according to the seasons. This reveals that the natural time of day and the biological time of night are different. Accordingly, contrary to opinions that the biological clock is only at one time of the day, the biological clock has two separate timings as night and day. The determination of the natural time of day and night varies according to seasons and regions.

Many studies have been done on the biological clock. These studies were mostly done with the titles of the biological clock, circadian rhythm, and circadian clocks. The overwhelming majority of these studies have suggested that there is a biological clock in only one-hour intervals on a 24-hour day. Among the so many studies on the biological clock, few researchers stated that there are two times a day, one for the night and one for the day. Among the many studies on natural time, some researchers agreed that there are two hours of biological time, one for the night and the other for the day[21, 22].

Some investigators[21, 22] have stated that the biological clock does not have a single time within 24 hours, there are two different times in the day and night period and that the natural time containing the most suitable time for treatments exists in these two time periods. Recently, one study supported this statement[23]. Studies to the Biological Clock/ Circadian Rhythm related to biological clock have been determined on a daily basis, mostly including 24 hours. For example, there is only a one-time zone per day, including day and night, for people like Pei and colleagues, who search for the biological clock during the day. On the other hand, according to Pei et al. and similar studies, the biological clock is available overnight within a 24-hour time frame[24].

Many studies have been conducted on the biological clock and the treatment of diseases. The most famous of these was done by Jeffrey Connor Hall, Michael Rosbash, and Michael Warren Young. This work earned them the Nobel Prize in Physiology and Medicine in 2017. In their work, the authors made inventions about the molecular mechanisms that regulate the circadian rhythm[25].

Besides, Gaikwad explained the interaction between the biological clock, transcriptional feedback loop, and neuroscience, in which they identify genes and proteins that work together in both humans and animals[26]. One of the recent studies on the relationship between biological clock and therapy belongs to Ruben et al. In their study, Ruben et al. suggested that the treatment be carried out in a biological clock direction. However, he did not suggest a distinct time zone[27].

According to these studies, the Circadian rhythm is determined by an internal biological clock that predicts day/night cycles to optimize the physiology and behaviour of organisms. Various biological processes, such as sleep patterns, nutritional action, hormone release, blood pressure, and body temperature, follow this consistent rhythm.

In these and similar studies, although the biological clock was stated to be effective in treatment, they emphasized that treatment can be applied within a single day, regardless of day and night.

CONCLUSION

In scientific studies on the biological clock, it was emphasized that there are internal and external factors affecting the physical and psychological life of man. They divided the activities of the human body, organs, and hormones into certain time zones "daily". They made this distinction over 24 hours. In these studies, on the biological clock, it was emphasized that the most efficient clock related to human health is in a single time frame per day. However, life consists of day and night. There are cells that workday and night. For example, the `pineal body works at midnight. There are two different times in the day and night period and that the biological time containing the most suitable time for treatments exists in these two time periods. To get the best result of treatment, the most appropriate biological clock is the time closest to sunset and the last third of the night before sunrise. These two time periods change according to summer and winter, region and continent, the long and shortness of day and night.

CONFLICT OF INTEREST

The author declares that there are no competing interests in publishing this article.

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ORIGINAL ARTICLE

A Single Centre Annual Audit on Computed Tomography Pulmonary Angiogram: Demographic, Clinical Scoring System, Patients' Outcome

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Keywords: audit, computed tomography pulmonary angiogram (CTPA), clinical scoring system, pulmonary embolism

ABSTRACT

Computed tomography pulmonary angiogram (CTPA) is widely used in the investigation of suspected pulmonary embolism. CTPA is not without adverse effects as it involves intravenous contrast injection and radiation exposure. The annual incidence of pulmonary embolism is 60 – 70 per 100,000 populations and CTPA remains the commonest imaging modality1. This study aims to audit all CTPA performed at Hospital Sultanah Nora Ismail, Batu Pahat, Johor for the entire year of 2018 to illustrate the demographic data, symptoms, risk factors, clinical scoring system applied and patients' outcome. A retrospective study was conducted to audit all CTPA performed between 1st January to 31st December 2018 via the radiology department electronic records and patients' records. There were a total of 60 CTPA performed in the entire year of 2018 with 16 positive and 44 negative scans. Among the 16 positive scans, 7 (44%) had a Wells score above 6, 6 (38%) had a Wells score between 2 – 6 and 3 (18%) had a Wells score less than 2. Out of the 16 positive scans, 4 (25%) were known malignancy and 1 was a known case of anti-phospholipid syndrome. All 60 patients had electrographs and arterial blood gases performed prior to CTPA. D dimer was performed in 15 cases (5%). Among the 16 positive scan patients, 4 (25%) passed away during the same admission directly or indirectly related to pulmonary embolism. This annual computed tomography audit report will assist clinicians in making better diagnostic decision when dealing with patients with suspected pulmonary embolism.

INTRODUCTION

Pulmonary embolism (PE) is commonly seen in our daily practice and can be life threatening and sometimes fatal[1]. The overall incidence of PE is approximately 112 cases per 100,000 populations. Early recognition of this potentially fatal disease is hence very important. Pulmonary embolism accounts for up to 6% of hospital death[1]. Pulmonary embolism is slightly more common in males than females and incidence increases with age. In Malaysia, the incidence of venous thromboembolism is on the rise due to an aging population, higher rates of complex surgery, high rates of caesarean section deliveries, rise in obesity and cancer cases, and a low rate of thromboprophylaxis[2, 4]. Pulmonary embolism is due to an obstruction of a pulmonary artery or one of its branches by any material such as a thrombus, tumour, air or fat that originated elsewhere in the body. Acquired factors such as immobilization, malignancy, infections, advancing age, heart disease, major surgery increase the risk of venous thromboembolism. The pathogenesis of pulmonary embolism was explained by Virchow as venous stasis, endothelial injury and hypercoagulability[4]. All risk factors for venous thromboembolism influence at least one of these three Virchow's criteria. Venous thrombi generated in venous pocket at sites of venous stasis or following vessel wall injury[1]. Wide variety of clinical manifestations of pulmonary embolism may impede early diagnosis of this disease[2, 4]. CTPA is widely accepted as one of the first line modalities to diagnose pulmonary embolism[4, 5]. Even though this imaging modality is widely available in Malaysia, clinical decision to subject a patient to this imaging is often difficult. CTPA exposes patients to radiation and intravenous contrast agents. Pre-test probability such as Wells score, Modified Wells score, or Modified Geneva score have been developed to assist busy clinicians to make important decision, however a significant percentage of patients are too unstable and unsafe to undergo this imaging. The aim of this study was to conduct an annual audit on all CTPA cases performed between 1st January 2018 and 31st December 2018 by assessing the patients' demographics, clinical scoring systems and outcome in Hospital Sultanah Nora Ismail, Batu Pahat, Johor, Malaysia.

MATERIALS AND METHODS

Study Design and Population

This is a single centre annual audit to evaluate all the CTPA performed in Hospital Sultanah Nora Ismail, Batu Pahat, Johor between 1st January 2018 and 31st December 2018. There were no missing data in this study. All data were collected from our radiology department records and patient's case notes. This audit was approved by the Malaysian Ministry of Health Institutional Review Board and Medical Research Ethics Committee. A standard questionnaire was used to record the demographic, venous thromboembolism risk factors, pulmonary embolism rule out rule (PERC rule) and Wells clinical scoring and patients' outcome.

Clinical scoring system

The pulmonary embolism rule out criteria (PERC rule) consists of eight criteria are age less than 50 years old, heart rate less than 100 beats per minute, oxyhaemoglobin saturation more than 95 per cent, no haemoptysis, no oestrogen use, no prior deep venous thrombosis or pulmonary embolism, no unilateral leg swelling and no surgery/trauma requiring hospitalization within the prior four weeks[2]. It is used to identify patients with low clinical probability of pulmonary embolism in whom the risk of a CTPA study outweighs the risk of pulmonary embolism[2]. This rule is valid in patients with a low clinical probability of pulmonary embolism (gestalt estimate less than fifteen percent). In patients with a low probability of pulmonary embolism who fulfil all eight criteria, the likelihood of pulmonary embolism is low, and no further testing is required.

The Wells score for pulmonary embolism consists of physical findings suggestive of deep vein thrombosis, no alternative diagnosis to explain the illness, tachycardia with pulse more than 100 beats per minute, immobilization for more than 3 days or surgery in the previous four weeks, prior history of DVT or PE, presence of haemoptysis and presence of malignancy. In the Wells risk score interpretation, a score of more than 6 indicates high probability, score of 2-6 indicates moderate probability while a score of less than 2 indicates low pulmonary embolism probability[4].

Statistical Analysis

Descriptive analysis was presented as counts and percentages for categorial variables. The distribution of data was conducted using Fisher's exact test. Statistical significance was set at p-value < 0.05. Data analysis was done via statistical package for social science (SPSS). (version 25; SPSS Inc., Chicago, IL. United States of America).

RESULTS

Table 1 shows the demographic and clinical characteristic of the 60 subjects. There were no significant association between the different demographic variables and CTPA outcome. The average mean age of patients with no pulmonary embolism and pulmonary embolism are 52.12 and 46.5 years old.

Table 1 Demographic and clinical characteristics of no pulmonary embolism (PE) and PE cases (n = 60)

Demographic	No pulmonary embolism (n = 44)		Pulmonary embolism (n = 16)		*P* value
	Mean (SD)	*n* (%)	Mean (SD)	*n* (%)	
Age	52.12 (17.6)[a]		46.5(23)[a]		0.318[b]
< 20 years		3(0.07)		0(0)	
21 – 40 years		8(0.18)		3(0.19)	0.269[b]
41 – 60 years		14(0.32)		9(0.56)	
> 60 years		19(0.43)		4(0.25)	
Gender					
Male		19(0.43)		7(0.44)	0.969[b]
Female		25(0.57)		9(0.56)	
Ethnicity					
Malay		39(0.89)		14(0.88)	0.903[b]
Chinese		5(0.11)		2(0.13)	

a = Mean (Standard deviation)

n = Number of subjects

b = Fisher's exact test

Table 2 shows the relationship between Wells score and the CTPA results. In the 16 CTPA confirmed pulmonary embolism cases, all have a Wells score of above 2 points. Thirty of the negative pulmonary embolism cases had a Wells score of below 2 points. There is a significant relationship between Wells score and CTPA result.

Table 2 Relationship between Wells score and computed tomography pulmonary angiogram results

Wells score	**CTPA results**				***P*-value**
	No pulmonary embolism (*n* = 44)		**Pulmonary embolism (*n* = 16)**		
	n	**%**	***n***	**%**	
More than 6 points	2	3	7	12	<0.001[a]
2 to 6 points (Moderate probability)	12	20	9	15	
Less than 2 points (Low probability)	30	50	0	0	
n = Number of subjects *a* = Fisher's exact test					

The relationship between PERC score and CTPA result is shown in Table 3. In the 44 patients with negative pulmonary embolism, 5 patients fulfilled the entire PERC rule. There was no significant association between fulfilling PERC rule and a negative CTPA result seen in this study likely because of the inadequate samples size.

Table 3 Relationship between PERC score and CTPA results

Pulmonary embolism rule out criteria (PERC rule)	**CTPA results**				
	No pulmonary embolism (*n* = 44)		**Pulmonary embolism (*n* = 16)**		***P*-value**
	n	**%**	***n***	**%**	
Fulfilled all 8 criteria	5	8	0	0	0.311[a]
Did not fulfil all 8 criteria	39	65	16	27	
	n = Number of subjects *a* = Fisher's exact test				

Most of the patients with (100%) or without (91%) pulmonary embolism presented with dyspnoea. All most all of them has tachycardia and tachypnoea (Table 4).

Table 4 Symptom, physical findings, diagnostic test, comorbid and patients' outcome (*n* = 60)

	CTPA results			
	No pulmonary embolism (*n* = 44)		Pulmonary embolism (*n* = 16)	
	n	%	*n*	%
Symptoms				
Pleuritic chest pain	3	7	12	75
Substernal chest pain	5	11	10	63
Dyspnoea	40	91	16	100
Syncope	5	11	2	13
Haemoptysis	2	5	3	19
Physical findings				
Tachycardia	44	100	16	100
Tachypnic	44	100	16	100
Hypotension	0	0	5	31
Type 1 respiratory failure	38	86	16	100
Fever	24	55	8	50
Wheezing	5	11	6	38
Unilateral leg swelling	0	0	3	19
D dimer				
Positive	9	20	5	31
Negative	0	0	1	6
Not investigated	35	80	10	63
ECG changes				
Sinus tachycardia	44	100	16	100
S1Q3T3	3	7	4	25
Arterial blood gas results				
Type 1 respiratory failure	44	100	16	100
Comorbid				
Known malignancy	9	20	4	25
History of thrombosis	3	5	3	19
APLS	0	0	1	6
Outcome				
Discharge	40	91	12	75
Death	4	9	4	15

There were a total of 60 computed tomography pulmonary angiograms performed in the entire year of 2018 with 16 positive and 44 negative scans. Among the 16 positive scans, 7 (44%) had a Wells score above 6; 6 (38%) had a Wells score between 2 – 6 and 3 (18%) had a Wells score less than 2. The youngest patient was 19 years old and oldest 87 years old with a mean age of 52 years old. The ethnicity breakdown comprised of Malay (53, 88%) and Chinese (7, 12%). The patients are from medical (24, 40%) surgical (13, 22%), orthopaedic (7, 12%), obstetric (6, 10%), gynaecology (6, 10%) wards and intensive care unit (4, 6%). Out of 16 positive scans, 4 (25%) had known malignancy and 1 patient had anti-phospholipid syndrome. All 60 patients had electrographs and arterial blood gases prior to CTPA. D dimer was performed in 15 cases (25%). Among the 16 positive scan patients, 4 (25%) passed away during the same admission directly or indirectly related to pulmonary embolism.

DISCUSSION

Pulmonary embolism is a clinical condition in which the pulmonary artery or one of its branches is obstructed by a blood clot. An estimated of 600,000 cases occur in United States each year with case fatality rate of 2%[2]. Deep vein thrombosis is one of the major cause of pulmonary embolism[4, 5]. Based on the PIOPED II study, almost all of the patients with pulmonary embolism had one or more risk factors such as immobilization, travel of 4 hours or more in the past month, surgery within the last 3 months, malignancy, injury to the lower extremities and pelvis during the past 3 months, smoking, central venous instrumentation within the past 3 months, stroke, cardiac failure, history of pulmonary embolism, and chronic obstructive pulmonary disease[5, 6].

Stein PD et al. (2007) reported that pulmonary embolism can have a wide range of manifestations including shortness of breath at rest on exertion (73%), pleuritic chest pain (66%), cough (37%), orthopnoea (28%), signs and symptoms of deep vein thrombosis (44%), wheezing (21%), haemoptysis (13%) and cardiac arrythmia, syncope or presyncope and hemodynamic collapse (less than 10%)[7].

Computed tomography pulmonary angiography is the first-choice imaging modality to diagnose pulmonary embolism as it is sensitive and specific[8]. When CTPA is contraindicated for example due to a prior allergy to contrast, renal insufficiency, or the result is inconclusive, ventilation perfusion scan can be considered. Based on PIOPED study, ventilation perfusion can be interpreted into normal, low-probability PE, intermediate-probability PE, high-probability PE[8,9]. If a patient is deemed unfit, contraindicated or facilities for both CTPA and ventilation perfusion scan not available, lower limb ultrasound with Doppler may be useful. It is however non-diagnostic and has low sensitivity[9, 10].

Scoring systems has been developed to facilitate clinicians in making diagnosis of pulmonary embolism as the sign and symptoms often mimics other disease. Wells criteria includes clinical symptoms of deep vein thrombosis (3 points), other diagnoses are less likely than PE (3 points), heart rate > 100 (1.5 points), immobilization three or more days or surgery in previous four weeks (1.5 points), prior deep vein thrombosis or pulmonary embolism (1.5 points), haemoptysis (1 point), malignancy (1 point). The score obtained may classify patients into a three-tier system i.e. low risk (Wells score < 2), moderate risk (Wells score 2 – 6), high risk (Wells score > 6).

Other useful scoring system include Pulmonary Embolism Rule-out Criteria (PERC) score at which a patient who fulfilled all the criteria i.e. age < 50 years old, heart rate < 100 beats per minute, oxyhaemoglobin saturation > 95 per cent, no haemoptysis, no oestrogen use, no prior deep venous thrombosis or pulmonary embolism, no unilateral leg swelling and no surgery/ trauma requiring hospitalization within the prior four week has low risk of pulmonary embolism.

Another scoring system comparable to Wells score is Geneva criteria. It includes age more than 65 (1 point), prior deep vein thrombosis or pulmonary embolism (3 points), surgery under general anaesthesia or fracture of lower limbs (2 points), active malignancy (3 points), unilateral lower limb pain (3 points), haemoptysis (2 points), heart rate 75 – 94 (3 points), heart rate more than 95 (5 points) and tender on lower limb palpation or unilateral oedema (4 points). Patients are stratified into low risk (0 – 3), intermediate risk (4 – 10) and high risk (> 11) based on Geneva criteria. However, based on one study, it was thought that Wells score is more accurate than Geneva criteria in predicting pulmonary embolism[11].

Based on our study, by applying the pre-test Wells score which has a high negative predictive value for low risk group (NPV =

100%), all patients in this group have no pulmonary embolism. This may be a very good clinical indicator that patient in this group may not need CTPA and other differential diagnosis should be considered. PERC has a high sensitivity and positive predictive value (PPV, Sensitivity = 100%). All patients who were diagnosed with pulmonary embolism had at least fulfilled one of the PERC criteria and all patients who do fulfil any of the PERC criteria had negative findings in their CTPA.

PERC is a good clinical scoring system to exclude pulmonary embolism[12]. Result of D-dimer was not included in both wells score and PERC[13]. We found that majority of patients with suspected pulmonary embolism in our centre had no D-dimer investigated. According to Malaysia Clinical Practice Guidelines on the prevention and treatment of venous thromboembolism year 2013, there are many D-dimer assays in the market, and they all lack standardization and appropriate cut off [14]. The whole blood agglutination method for D-dimer testing often used in most Malaysian Laboratory is not sensitive in ruling out venous thromboembolism[15]. Necessity of using D-dimer in a suspected pulmonary embolism is somehow controversial as they are many different D-dimer assays available in our market which are not standardized. We suggest to study the relationship between local D-dimer assays and efficacy of applying PERC rules in our local setting in another study. A single centre cohort and small sample size were the limitations of this study.

CONCLUSION

This computed tomography pulmonary angiography annual audit report will assist clinicians in making better diagnostic decision when dealing with patients with suspected pulmonary embolism. The aims of avoiding unnecessary imaging include extra cost of hospitalization, unnecessary radiation, potential contrast induced nephropathy and allergies.

CONFLICT OF INTEREST

The authors declare that they have no competing interests in publishing this article.

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ORIGINAL ARTICLE

Effects of Alcohol towards Quality of Life in the Indigenous Groups of the West Coast Division, Sabah, Malaysia

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ABSTRACT

Alcohol consumption has consequences for the health and quality of life of individuals and communities. It is a problem among some of the Indigenous groups of Sabah and Sarawak with some of the highest prevalence of risky drinking in Malaysia. Alcohol is considered to be part of the culture of some of these Indigenous groups and a way to maintain the connection to their culture and traditions. However, drinking too much on a single occasion and drinking regularly over time is not a part of the culture. Therefore, this study aimed to investigate the positive and negative effects of alcohol on quality of life (QoL) of an Indigenous community of Sabah. A total of 56 villagers from the West Coast Division of Sabah were interviewed in focus group discussions using the diamond dialogue tool. Data were analysed using thematic analysis and revealed that alcohol consumption has both beneficial and adverse effects on health, behavioural, social, economic and psychological factors, depending on the drinking patterns. These harmful results suggest that awareness and harm-reduction programmes may help to empower the Indigenous groups of Sabah to reduce alcohol-related harm.

INTRODUCTION

According to the World Health Organization (WHO), alcohol is the world's third-largest risk factor fordisease burden[1]. In 2016, alcohol was reported as representing 132.6 million disability-adjusted life years (DALYs) globally which represented 5.1% of all DALYs in that year[1]. It is known to cause more than 200

communicable and non-communicable diseases and injuries[2]. In 2011, there were more than 2 billion people worldwide consuming alcoholic beverages and out of that 76.3 million had an alcohol use disorder[1]. The harmful use of alcohol caused an estimated 3 million deaths globally in 2016[1]. In the same year, Malaysia was reported to be the tenth largest consumer of alcohol in the world[3]. Sabah is listed as having the third-highest prevalence of risky drinkers after Kuala Lumpur and Sarawak[4]. Alcohol is also associated with a significant reduction in quality of life, both for individuals and communities[1]. Quality of life is an important parameter that provides an insight into how a disorder impacts the lives of those affected.

QoL is defined as a measure of the whole person, including physical and mental health and social well-being[1]. A healthy QoL is not just the absence of acute disease or chronic illness but is re-conceived as a positive state of overall subjective well-being. This concept involves the dimensions of biological, psychological, sociological and economic factors that include a sense of achievement and mastery over individual goals. It can also be an important measure in tracking treatment outcomes for alcohol use disorders[5]. Compromised quality of life has been linked to depression, anxiety and alcohol consumption[6]. According to McCulloch (2006),[6] many people drink alcohol to help deal with anxiety and depressive thinking patterns.

In Sabah, alcohol is considered to be a part of traditional culture, especially for some of the Indigenous groups[7]. These Indigenous communities in Sabah, such as Kadazandusun, Murut, Sungai and Rungus[8], consider alcohol to be part of everyday life and as a key factor in maintaining the culture and traditions[7]. A study found that youth in these Indigenous groups start drinking at or before 15 years of age[8]. They often start drinking the traditional home-brewed alcohol (such as *tapai* and *montoku*) and later venture into drinking "western-style" beverages such as beer and spirits[8]. Drinking alcohol is known to have some benefits such as helping to celebrate and socialize and enhancing the joyfulness of ceremonies[9]. It is also used as part of social, business, and family life, an enjoyable and habitual accompaniment to food and celebrations. However, drinking alcohol to the point of intoxication has not been reported to be a part of tradition among these Indigenous groups[10]. Moreover, according to Asmat (2018)[11], the abuse of alcohol can destroy the aim of these cultures. This pattern of drinking contributes to serious health consequences[2] and increases the chances of hurting oneself or others due to accidents, violence and suicide[1].

According to Singh (2012)[12], alcohol consumption in Sabah peaks during the Kaamatan month (yearly in May) among Kadazandusun communities. Kaamatan or Pesta Kaamatan is a form of harvest festival which is celebrated annually by ethnic Kadazandusun in Sabah, Malaysia. Several activities are held during Kaamatan such as cultural dance and music, traditional sports and games, carnivals and the grand Unduk Ngadau, otherwise known as Miss Kaamatan (Harvest Festival Queen). During most festivals in Sabah (including Kaamatan. Christmas and New Year), alcohol prices are controlled by the Government preventing traders from taking advantage of the public and profiting by raising the price. Traders who are found not following the pricing set by the Government are fined. The culture of many Indigenous groups is strongly connected to drinking alcohol but does not encourage abuse[11]. Research has not previously been done looking at the role alcohol plays in the QoL of these communities and this study aimed to address this gap in knowledge through exploring the role of alcohol in the lives of Indigenous groups from the Western Division of Sabah.

MATERIALS AND METHODS

This qualitative study was using focus group discussions for the collection of data. The study was conducted between 2016 and 2017 in numerous villages in the West Coast Division. Communities were purposively selected for this study and identified as Kadazandusun, being an alcohol-consuming community, and having some awareness of the harms caused by alcohol for their people. Participants included community members aged between 15 and 75. More females than males attended, and groups created were gender-specific and of varied ages, with members from each village being placed in the same group where possible.

Participants and Location

Purposive sampling was applied to select hazardous and harmful drinkers among the indigenous communities of Sabah. As recommended by Babor et al. (2013)[13] hazardous and harmful drinkers are suggested for brief education and brief intervention to reduce the alcohol related harm. By knowing the impact of drinking style towards alcohol-related harm would help to develop an appropriate intervention for further study. Screening by using AUDIT was done to select participants who scored between 8 to 19 on AUDIT or known as hazardous and harmful drinkers. The data was collected in one community meeting during the 'Leaders United Event of indigenous people of Sabah' at PACOS-Trust located in Penampang, Sabah. PACOS-Trust stands for Partnership of Community Organization. PACOS-Trust is a community-based organization dedicated to supporting indigenous communities in Sabah. A total of 56 villagers from the communities were involved in this study. In-depth focus group interviews were used to investigate the beneficial and adverse effects of alcohol on wellbeing in these communities.

Materials and Procedure

The Diamond Dialogue tool by Willetts et al. (2018)[14] (Figure 1) was used to identify the impact of alcohol consumption on the health and quality of life of the Indigenous groups included in this study. It has been previously used as a research tool to evaluate the effectiveness of interventions in improving the quality of life in a variety of contexts[14]. Diamond Dialogue: A Tool to Explore Alcohol-related Harm and Strengthen Community Action[10]. The Diamond Dialogue is a diamond-shaped tool, used to capture a diverse number of perspectives during the discussions (Figure 2). A happy face is placed at the top of the diamond representing "perfectly satisfied" and a sad face at the bottom representing "completely dissatisfied" with their sense of the quality of life. The researcher(s) begin by asking participants about their definition of happiness and unhappiness: "What does happiness mean to you?", "What does unhappiness mean to you?", followed by identifying the factors that influence "What makes you happy?", "What makes you unhappy?". Participants were then asked about the effect alcohol has on the quality of life in their community: "What's positive about alcohol?", "What's negative about alcohol?", "What role does alcohol play in your culture?". Participants were also asked to mark on the diamond provided by the researcher(s) the happiest they had ever been and the saddest they had ever been between the extremes very happy and very unhappy. The Diamond Dialogue was used because it was found to be a useful tool to allow each person to reflect and make their meaning in their discussion as well as getting rich qualitative data[15]. Notes were also taken by the researcher(s) in response to these questions.

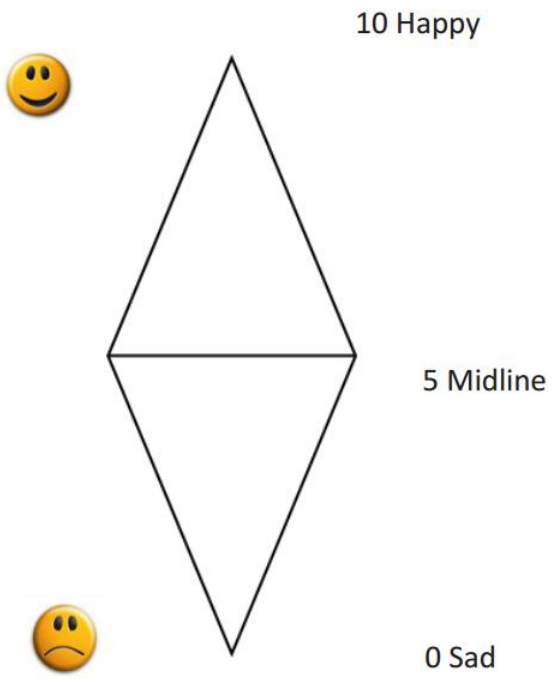

Figure 1 Diamond with categories

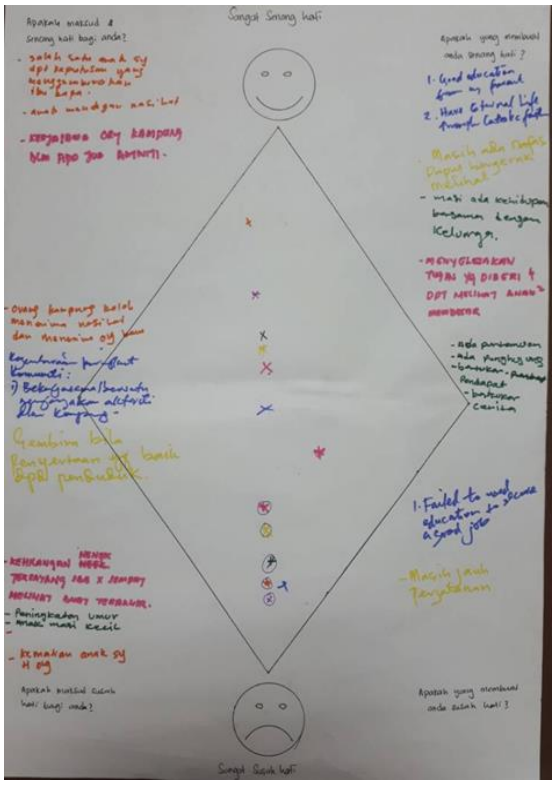

Figure 2 Example of Diamond Dialogue

Notes: This figure illustrates one of the diamond dialogue maps generated during a focus group discussion in the village. Six villagers participated in the discussion. Each villager used a different colour pen to mark their response and their current subjective state of well-being. The happiest they had ever been marked with an X symbol and the saddest they had ever been with (X) symbol.

Data Analysis

To identify themes and subthemes, transcript interviews were entered into a qualitative data analysis tool (Atlas.ti, version 7). The data was analysed using thematic analysis to identify the factors influencing alcohol consumption from the perspective of participants. The thematic analysis allows for understanding the potential of any issue more widely. The analysis followed an inductive approach including coding, writing comments and memos, familiarization, networking and linking and interpretation of the data[16]. The analysis was conducted by the team of researchers, with consultation and negotiation enabling the formation of the final themes explored in this study.

RESULTS

As for gender distribution, there was 29 female and 27 males participated in this study. For the range age, 29 participants were in the range age of 18 to 35 years old, while 27 participants were in the range age of 36 to 55 years old. A total of 24 were single, 29 were married, while 3 were divorced. There were 51 Christian, while 5 were Muslim. As for the job sector, 32 were self-employed, 6 working with government, and 18 were working with a private company. There were 25 smoking and 31 were non-smoking (Table 1). Among the participants, 51 (91.1%) were Kadazandusun and 5 (8.9%) were Bajau (Figure 3).

Table 1 Demographics of participants

Variables	Frequency (*N* = 56)	Percentage (100%)
Gender		
Female	29	51.8
Male	27	48.2
Age		
18 – 35 years	29	51.8
36 – 55 years	27	48.2
Status		
Single	24	42.7
Married	29	51.8
Divorce	3	5.5
Religion		
Christian	51	91.1
Muslim	5	8.9
Job sector		
Government	6	10.7
Private	18	32.2
Self-employed	32	57.1
Smoking		
Yes	25	44.6
No	31	55.4

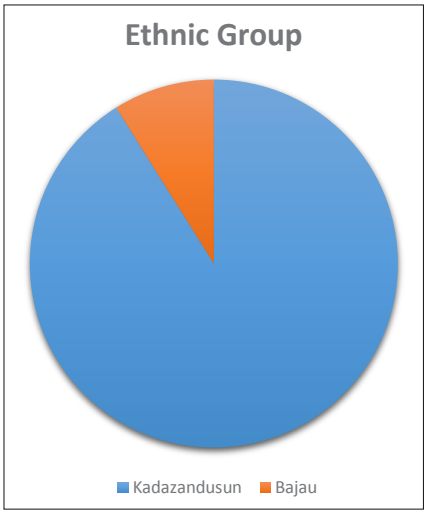

Figure 3 Ethnic group

This study found five primary factors related to alcohol consumption in these communities which contribute both positively and negatively to the overall QoL. These were labelled health, behavioural, social, economic and psychological (Figure 4.).

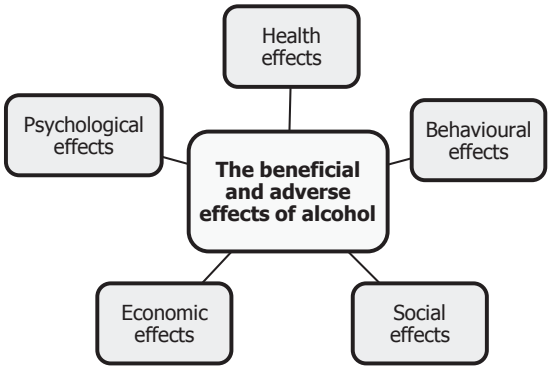

Figure 4 The beneficial and adverse effects of alcohol consumption

Table 2 shows the five beneficial and adverse effects of alcohol consumption.

Table 2 The beneficial and adverse effects of alcohol

	Beneficial effects of alcohol	Said by		Adverse effects of alcohol	Said by	
		K	B		K	B
Health effects	To mix with food (chicken soup)	Yes		Loss of balance	Yes	Yes
	To treat disease	Yes		Headache	Yes	Yes
				Disease	Yes	Yes
				Premature death	Yes	Yes
Behavioural effects	To train the voice to sing	Yes	Yes	Addiction	Yes	Yes
	To become brave	Yes	Yes	Fighting	Yes	Yes
	To achieve goals in playing dart and reach high notes in singing	Yes		Family and domestic violence	Yes	Yes
		Yes		Short temperedness	Yes	Yes
				Homeless	Yes	Yes
				Lies	Yes	Yes
				Family conflict	Yes	Yes
				Children neglected	Yes	Yes
				Loss of control	Yes	Yes
				Forgetfulness	Yes	Yes
				Irrational talk	Yes	Yes
				Waste of money and time		
Social effects	To make new friends	Yes	Yes	Accidents	Yes	Yes
	To spend time with friends and community			Drunkenness	Yes	Yes
	More joyous	Yes	Yes	Injuries	Yes	Yes
	Tighten relationship	Yes	Yes	Danger to other	Yes	Yes
	To open conversation	Yes	Yes	people	Yes	Yes
	Gathering	Yes	Yes	Social problems		
	To fill free time	Yes				
		Yes	Yes			
Economic effects	Business	Yes		Did not turn up for	Yes	Yes
	Tourist attraction	Yes		work	Yes	Yes
				Reduce performance	Yes	Yes
				Financial problem		
Psychological effects	Satisfaction	Yes	Yes	Unsatisfied	Yes	Yes
	Release stress and tired	Yes	Yes	Jealousy	Yes	
	Express feelings	Yes		Depression	Yes	Yes
	Happy	Yes	Yes	Distasteful to women	Yes	

Note: K = Kadazandusun, B = Bajau

Health Factors

According to participants, alcohol was used to improve health and treat illnesses including reducing high blood pressure, to improve blood circulation, and for women post-delivery. Besides drinking alcohol, these groups also use alcohol for cooking, such as to mix with chicken soup. All participants agreed that a high intake of alcohol can have negative impacts on health for example stroke, gout, loss of balance, diabetes and even premature death (Table 3).

Table 3 The quotes of positive and negative effects of alcohol on the health factor

Factor	Positive effects	Negative effects
Health	"Our grandparents they drink alcohol to treat high blood, and after delivery, the *lihing* is more suitable to mix with chicken soup, but just a little bit." (K)	"The bad aspect of drinking is gout, we call it GDL, *Gaut Datang Lagi* (gout come again), it causes stroke and premature death." (K)
	"There's a grandpa who drank one or two can of beer in a day, which he believed improve his blood circulation which was impact very good, If he not has fallen recently, I think he still would be quite well." (K)	"When we drink whole the night, the next morning we feel too sick to work, *kougutan* (drunk). When we are *kougutan* we don't have an appetite to eat, we don't turn up to work, and lack of energy. So, all we can do is sleep." (K, B)

Note: K = Kadazandusun, B = Bajau

Behavioural Factors

Participants agreed that producing and consuming traditional alcohol is one of the ways they seek to maintain their culture. At the same time, participants reported that alcohol helps them to achieve goals such as to excel at playing darts, to reach the high notes singing karaoke, to prepare their voice to sing and to have more courage when talking about emotions and feelings. However, they also recognized that consuming alcohol excessively can lead to negative emotions (short temperedness), erratic thoughts, irrational talk, waste of money and time, family and domestic violence, fighting, accidents, homelessness and being addicted to the alcohol (Table 4).

Table 4 The quotes of positive and negative effects of alcohol on behavioural factor

Factor	Positive effects	Negative effects
Behavioural	"If you get a bit drunk, you can reach the high notes. Same goes for playing dart, there are focus and concentration." (K, B)	"Bad stories from the pass are reemerged when you are drunk. The bad are irrational and hurtful talk which end up with fighting." (K, B)
	"When drunk, we can talk more easily, and we are not afraid to talk." (K, B)	"When you get drunk it can cause fighting, accidents, injuries, danger to other people who do not drink. Like in road or a celebration." (K, B)

Note: K = Kadazandusun, B = Bajau

Social Factors

Alcohol is reported by participants to be an important part of socializing and is used to help make new friends, to open conversations, to tighten relationships, to have time with friends and family as well as to make parties or festive ceremonies more joyous. Alcohol is also recognised to negatively influence behaviour when people become intoxicated. It can lead to fighting and accidents, and danger to oneself and other people such as injuries caused by fighting and road traffic accidents as well as unplanned and unprotected sex (Table 5).

Table 5 The quotes of positive and negative effects of alcohol on the social factor

Factor	Positive effects	Negative effects
Social	"To tighten the relationship with friends and to get know strangers." (K, B)	"The bad effects of alcohol are getting drunk, easily getting angry, erratic thoughts, always wasting money, forgetfulness." (K, B)
	"Drinking is crucial to Kadazandusun culture, you enjoy events with family and friends more if alcohol is included." (K)	"About accident, if too drunk, getting involve in an accident if you are too drunk. Most of them die, only a few survived." (K, B)

Note: K = Kadazandusun, B = Bajau

Economic Factors

Participants discussed how alcohol can provide benefits in terms of business and as a tourist attraction. The groups interviewed agreed that alcohol is a viable source of income for those producing and selling it. They claimed that tourists often want to try the locally produced alcohol. However, alcohol can also cause financial problems either through the cost of purchasing commercial alcohol or the cost of treating illnesses caused by excessive consumption of alcohol. There are also indirect costs such as poor work and/or study performance and the impact of conflicts or domestic violence. Participants in this study claimed that some people did not turn up for work due to drunkenness or being hung-over (or kougutan) (Table 6).

Table 6 The quotes of positive and negative effects of alcohol on the economic factor

Factor	Positive effects	Negative effects
Economic	"Tourism product, cause some white people looking for *lihing* right." (K)	"When drinking alone we can control our alcohol consumption and expense. But when in a group some members may not contribute financially and leave others 'out of pocket'." (K, B)
	"I asked at Sabindo store and they told me that they can sell 2 to 3 hundred crates of Hollandia in a day." (K)	"When you get drunk, you don't realise hit your wife or your child, pounding the wall or damaging furniture in the house (TV, table, chair, etc.)." (K, B)

Note: K = Kadazandusun, B = Bajau

Psychological Factors

Moderate alcohol consumption may provide some psychological benefits such as to help release stress and to recover from tiredness after working long hours. Moderate consumption can also enhance positive emotions. Participants also reported that some people suddenly dare to talk in unfamiliar language, such as English, when they have been drinking. Drinking too much alcohol can lead to loss of memory (for example having no recall of the events from the previous evening), negative emotions (easily becoming angry), family conflict and some of male participants said that it is sometimes distasteful to women (no women like men who are always drunk) (Table 7).

Table 7 The quotes of positive and negative effects of alcohol on the psychological factor

Factor	Positive effects	Negative effects
Psychological	"If sometimes we're tired, and stressed, we feel a bit released after drinking." (K, B)	"Ya, the fighting between husband and wife. Kids can be neglected if overdrinking." (K, B)
	"If you get a bit drunk, you dare to talk in English and even having a conversation in English" (K, B)	"Feel happy only during the drinking but after that easy to get mad." (K, B)

Note: K = Kadazandusun, B = Bajau

DISCUSSION

The results revealed five categories of beneficial and adverse effects of alcohol consumption including health, behavioural, social, economic and psychological factors, depending on the pattern of the individual alcohol consumer. This study found that moderate alcohol consumption can provide some benefit for individuals and communities. However, adverse effects become evident when individuals drink excessively over long periods or engage in heavy episodic drinking. The results from this study confirm previous findings in the literature which report that alcohol can have both positive and negative effects[2, 17]. The harmful use of alcohol affects not only the drinker but also has negative effects on other people around the drinker: their family or household and the wider community.

Health Effects of Alcohol Consumption

We found that some of the Indigenous groups of Sabah use alcohol for cooking food and improving some health conditions. These Indigenous groups believe that alcohol can be used to treat some illness (such as to treat high blood pressure) and is beneficial for women after birth delivery (to heat their body). These findings support the results from a previous study that the benefits of moderate alcohol consumption[1] provide some health benefits to the body such as lowering risks for total mortality, coronary artery disease, diabetes mellitus, congestive heart failure, and stroke[17]. Moderate alcohol consumption may also give protection against heart attack, coronary vascular disease, ischaemic stroke and death from cardiovascular causes[18].

However, the harmful use of alcohol contributes to health consequences such as arrhythmias, heart failure, elevates blood pressure, stroke, diabetes and increased risk of breast cancer for women[17]. According to WHO[1], the harmful use of alcohol contributed to the estimated 3 million alcohol-attributable deaths globally in 2016. These deaths are reported to occur due to digestive diseases, unintentional injuries, cardiovascular diseases and diabetes with the highest percentage of digestive diseases (21.3%) and unintentional injuries (20.9%), followed by cardiovascular diseases and diabetes (19.0%), infectious diseases (12.9%), malignant neoplasms (12.6%), intentional injuries (7.8%), alcohol use disorder (4.9%) and epilepsy (0.6%). In addition, the 2018 Global status report on alcohol and health includes the contribution of some infectious diseases to all alcohol-attributable deaths. Alcohol has also been shown to increase the risk of unplanned and unprotected sex[17] and mortality risk from HIV/AIDS.

Behavioural Effects of Alcohol Consumption

The present study found that drinking small amounts of alcohol provides benefits in terms of positive behavioural effects for individuals (e.g. to have the courage to talk about emotions and feelings, to reach the high notes when singing, or to excel at playing darts). These findings are supported by the results of a previous study that found moderate alcohol consumption can help in making new friends[10, 19], and can improve other social activities through increasing the ability to laugh, to sing and to dance[20]. It was also found that heavy alcohol consumption contributes to many behavioural problems such as fighting, family and domestic violence, family conflict, neglect of children, addiction, etc. As found in other studies, increased behavioural problems include intentional injuries such as self-harm, suicide and interpersonal violence as well as unintentional injuries such as road traffic injuries, drowning, burns, poisoning, falls[21], as well as unintentional self-harm and interpersonal violence attributable to alcohol consumption[22].

The alcohol harm occurs not only to the drinker but also to the people around them, including her or his close family, relatives and friends, as well as to other road users[1]. Previous studies state that regular heavy alcohol consumption and heavy episodic drinking are associated with increased physical problems, antisocial behaviour, violence, accidents, suicide, injuries and road traffic crashes[23].

Social Effects of Alcohol Consumption

This study found that alcohol consumption in these Indigenous groups is influenced by social factors (e.g. forming new friendships network, having time to relax, tightened relationships with friends, etc.). It can be described by the Actor-Network Theory (ANT), where people are willing to connect with others and to interact with their environment[24]. According to ANT, we cannot ignore the web of connections

between all things, both human and non-human. In this study, it suggests that in a given social network, the actors, or the Indigenous people of Sabah are influenced not only by each other but by other non-person factors like alcohol. A study found that some of the Indigenous groups of Sabah use alcohol to improve social connectedness, in social events, and in helping them be more outgoing in social situations[10].

People need to have a connection to and interact with their environment, where they can feel a sense of belonging or being appreciated by the community. It is stated in Maslow's Hierarchy of Needs[25] that in the third stage of human needs, love and belonging are key factors for successful progression in life. According to Maslow's Hierarchy of Needs, people need a sense of belonging, receiving and giving love, as well as appreciation and friendship. As found in this study, having alcohol with others is an opportunity for the participants to socialise with friends, to make new friends and also to tighten the relationship with friends and community. A study found that peer pressure and social influence can have a powerful role in individuals choosing to drink, particularly in situations where alcohol is used or it is a part of socialising with friends[9]. Participants of the study also recognised that some of them were drinking too much alcohol which eventually caused negative effects, not only to themselves but also to their environment, their families and the community as a whole. These findings are similar to those found in the previous studies[40] that report alcohol-related harm occurs not only to the drinker.

Economic Effects of Alcohol Consumption

Alcohol was also reported by participants as providing benefits in terms of business and as a tourist attraction. The local alcoholic drinks in Sabah (e.g. *bahar*, *lihing*, *kinupi*, *tapai*, *montoku* and *sikat*) have become a tourist attraction and can generate income for those who are skilled at producing such drinks. Nevertheless, it also reported being the cause of financial problems for some people, either through the cost of purchasing commercial alcohol or the cost of treating illnesses caused by excessive alcohol consumption. Although Malaysia is a Muslim majority country, the country's population still consumes a high level of alcohol and permits the selling of alcohol to people who are not Muslim[26]. Malaysia was reported as the tenth highest alcohol consumption of alcohol per capita worldwide by the World Health Organization, with annual spending estimated RM2 billion on alcohol beverages[1].

Price is known to be one factor that can impact alcohol consumption and alcohol-related harm[27]. In general, lower socioeconomic groups experience higher levels of alcohol-related harm than wealthier groups with the same level of alcohol consumption[1]. Socioeconomic status is one of the various factors that influence a person's consumption of alcohol and outcomes. To reduce harmful alcohol consumption and alcohol-related harm, governments and other stakeholders recommend taking collective action (e.g. to collaborate with the Secretariat in developing a draft global strategy on harmful use of alcohol, to develop interaction with relevant stakeholders, national systems for monitoring alcohol consumption, to consider strengthening national responses, to prepare a draft global strategy to reduce the harmful use of alcohol, etc.) to support and empower communities[28].

Psychological Effects of Alcohol Consumption

Alcohol consumption and depression are correlated to some degree while recognizing that this association is extremely complex[29]. Although no participant reported drinking being directly related to depressed mood, some participants reported they consume alcohol to provide relief from feeling stressed and tired, to feel happy, to express feelings, or

to feel satisfaction. These findings are in line with other literature that reports many people experiencing anxiety or depression intentionally consume alcohol to reduce their stress and improve mood[30]. A study found some of the Indigenous groups of Sabah consume alcohol to improve their quality of life[10]. It also reported that alcohol was found as a key ingredient in their happiness, whereas, without alcohol, they believed their life to be uninteresting[10].

CONCLUSION

The present study concludes that alcohol has both positive and negative effects on the Indigenous groups of Sabah represented in this research. Drinking alcohol, for these groups is a way to maintain their culture and tradition. The culture allows alcohol consumption but does not encourage abuse of alcohol. Alcohol abuse can destroy the benefits and happiness they gain from drinking. This study also concludes that those who drink at home will not usually face the same social problems (such as fighting, road accidents, wasting time and money, and peer pressure) as those drinking outside the home in venues serving alcohol. Recommendations coming from this study include providing guidance and education on low-risk drinking be conducted in consultation with the communities. Alcohol education can be provided through the implementation of awareness programmes (e.g. campaigns, interventions, healthy lifestyles, etc.) at the community level, and involving the community in the development of these programs, to empower these communities to reduce alcohol-related harm and potentially improve their quality of life.

CONFLICT OF INTEREST

The authors declare that they have no competing interests in publishing this article.

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CASE REPORT

An Uncommon Life-Threatening Cause of Electric Alternans with Sudden Onset of Breathlessness and Chest Pain

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Keywords: tension pneumothorax, electrical alternans, cardiac tamponade, pericardial effusion, chest pain

ABSTRACT

Phasic ECG voltage changes or electrical alternans is a well-described ECG changes seen in the pericardial effusion and cardiac tamponade. Popular as once believed, this ECG features are no longer considered pathognomonic for pericardial effusion and cardiac tamponade. Electric alternans is observed in pneumothorax especially left-sided pneumothorax. This is a case of a 41-year-old man who presented with chest pain and breathlessness to the emergency department. Assessment in the emergency unit revealed an obvious distress man with a respiratory rate of 60 breaths/min with cyanosis There were generalised rhonchi and prolonged expiratory breath sound appreciated. Chest X-ray (CXR) was done and diagnosed to have left tension pneumothorax. Initial electrocardiogram (ECG) showed electrical alternans in all leads. He was intubated for respiratory distress followed by chest tube insertion. His initial ECG findings resolved after treatment of the tension pneumothorax. Doctors need to evaluate the cardiac findings along with respiratory findings.

INTRODUCTION

Electric alternans is observed in pneumothorax especially left-sided pneumothorax[1]. The presentation of chest pain and shortness of breath offers few differential diagnoses ranging from a life-threatening condition such as acute myocardial infarction and dissection of the aorta to a benign condition like musculoskeletal pain[2]. Often the diagnosis

is reached following history and examination coupled with the appropriate investigation. CXR and ECG are the two most essential investigations in the emergency setting[2]. These investigations tend to complement each other. However, there are a few occasions where there are conflicting findings in CXR and ECG as illustrated in this case. Accurate clinical judgement is needed in treating such patient as the saying goes "Always treat the patient and not the investigation". There are numerous case reports on this association between tension pneumothorax and electric alternans dated back to 1979 [1, 3, 4].

CASE PRESENTATION

A 41-year-old foreigner who was visiting his relatives in Malaysia presented with sudden onset of chest pain and breathlessness. He was walking to his relative's house when he felt a sudden pain over his chest. The pain was localised to his left anterior chest just below the clavicle, stabbing and pleuritic in nature without associated radiation, sweating, nausea or numbness over the neck, jaw and hands. The onset of pain was accompanied by breathlessness making him barely able to speak.

His medical history was significant for pulmonary tuberculosis treated in the year 2000. He denied a recent history of fever, chronic cough, loss of appetite and weight to suggest reactivation of tuberculosis. He worked as a manual labourer back in his country and visits Malaysia twice a year. Of note, he denied recent contact with an active tuberculosis case. He smokes 20 cigarettes per day and has a 20 packs/year smoking history. Since treated for TB in the year 2000, he enjoyed good health and rarely seeks healthcare attention in his hometown.

After the onset of symptoms, he was brought promptly by his relative to the nearest health clinic where he received his initial treatment. He was treated as severe exacerbation of obstructive lung disease and was transferred to the emergency department via ambulance.

Assessment in the emergency unit revealed an obvious distress man with a respiratory rate of 60 breaths/min with cyanosis. He was in a seated position, leaning forward with pursed-lip breathing. The jugular venous pressure was not assessed as the patient was too breathless to lie supine.

Vital signs were significant for oxygen saturation of 71% under room air, blood pressure 171/117 mmHg, heart rate of 130 beats/min and temperature of 37°C. Breath sound was audible bilaterally but slightly reduced over the left. There were generalised rhonchi and prolonged expiratory breath sound appreciated. Unfortunately, chest percussion was not performed during the assessment as the patient was too breathless to cooperate. He was intubated for respiratory distress followed by chest tube insertion upon discovery of pneumothorax in the chest X-ray. Both intubation and chest tube insertion were performed in the emergency department.

Arterial blood gases (prior to intubation) revealed pH7.10; pO_2 245 mmHg; pCO_2 79 mmHg; HCO_3 24.5 mmol/L; Base excess −7.3 and Lactate 3.7. The blood gases were taken under oxygen therapy with a rate of 10 L/min. A CXR was ordered post-intubation and was reviewed. CXR showed an extensive fibrotic change of both lungs with bullae. There was a hyperlucent rim over the left lung edges with a shifting of mediastinal structure to the right side. The CXR findings are consistent with secondary spontaneous pneumothorax in tension (Figure 1).

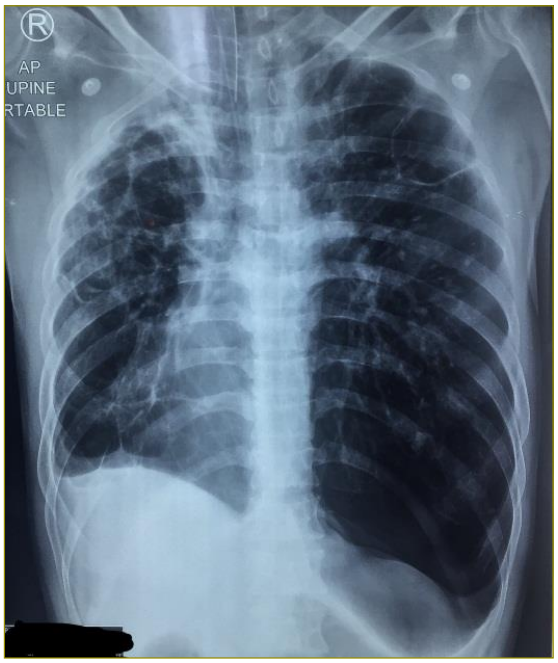

Figure 1 Extensive fibrotic changes with multiple bullae involving both lungs

There was a hyperlucent rim over the left lung edges with the shifting of mediastinal structure to the right side consistent with significant left pneumothorax. Ruptured bullae were suspected as the cause for pneumothorax in this case.

Initial ECG prior to chest tube insertion displayed sinus tachycardia with a phasic variation of the QRS complex amplitude in all leads (Figure 2).

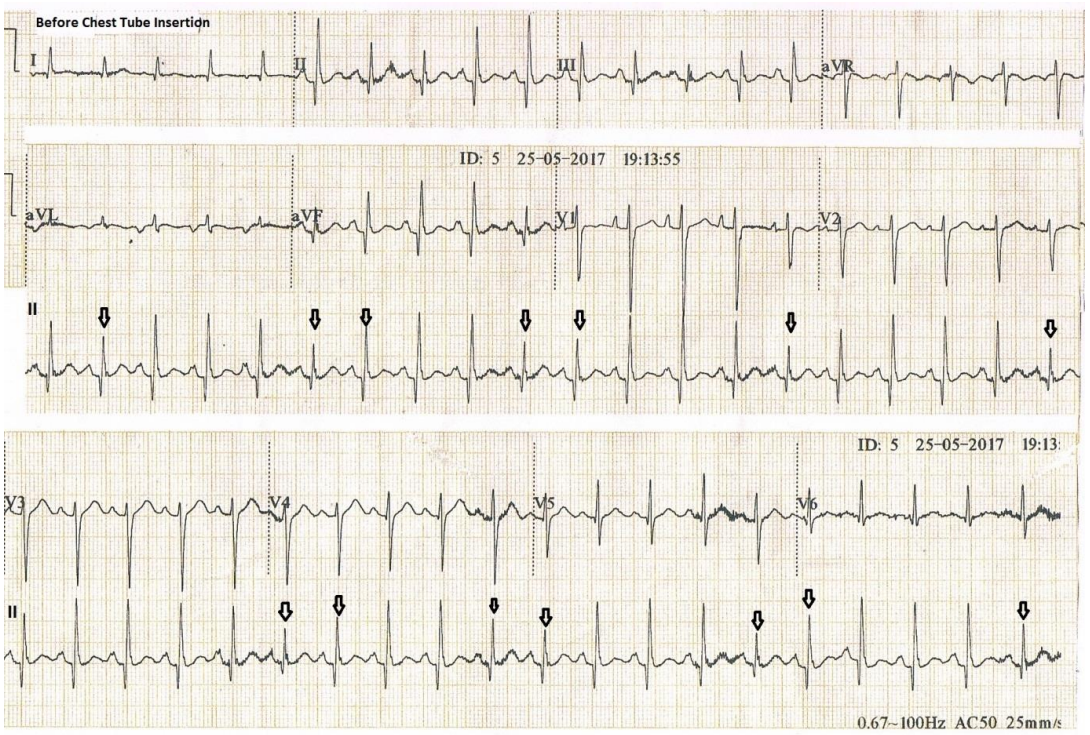

Figure 2 ECG showed the phasic variation of QRS amplitude or electrical alternans (black arrows). This ECG tracing was recorded before chest tube insertion.

The differential diagnosis for a patient with acute breathlessness and chest pain is wide-ranging from life-threatening conditions, i.e. acute myocardial infarction and dissection of the aorta to more benign causes, i.e. musculoskeletal pain and functional disorder (panic attack). In an emergency setting, the former conditions need to be ruled out first before considering a less serious diagnosis.

Upon diagnosing pneumothorax, a chest tube size 28F was inserted over a safety triangle of the left chest. There was audible 'hissing sound' and bubbling appreciated when the tube connected to under water drainage system. His vital signs improved after chest tube insertion with a blood pressure of 115/82 mmHg, heart rate 114 beats/min and SpO_2 100%. Respiratory examination showed improvement of breath sound over the left side without any audible rhonchi. Repeated ECG showed sinus tachycardia with QRS complex of equal amplitude (Figure 3). Repeated bedside echocardiography via the subcostal echo window showed no pericardial effusion with good cardiac contractility. These observations confirmed the diagnosis of left tension pneumothorax with electrical alternans or phasic variation of QRS amplitudes.

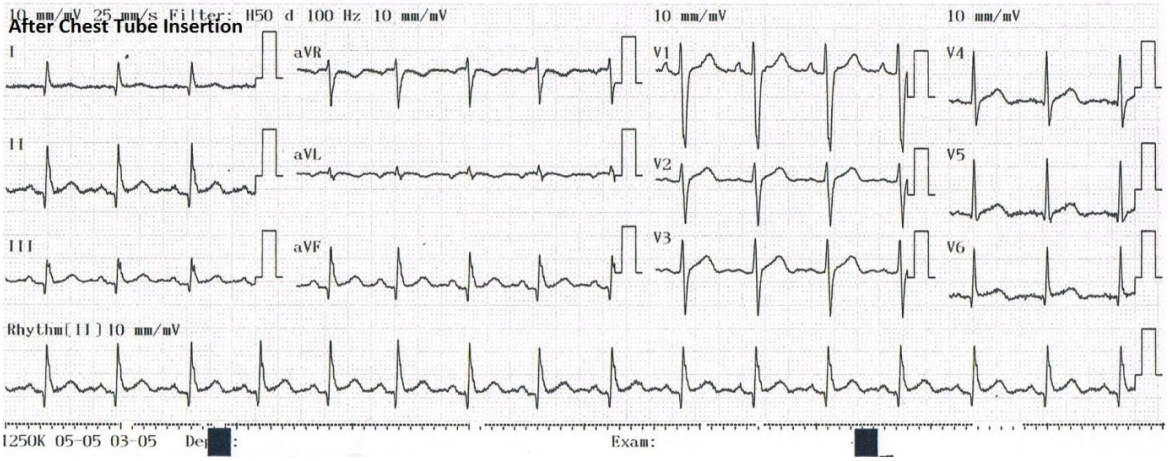

Figure 3 ECG tracing showed resolution of phasic variation of QRS amplitude/electrical alternans after chest tube insertion

He showed progressive improvement and was able to be weaned off from ventilator at day two of admission. The chest tube was off after five days without any recurrence of pneumothorax. His tuberculosis workup consisting of three good sputum specimens for acid-fast bacilli were negative, erythrocyte sedimentation rate of 15 mm/H (normal). His pneumothorax was attributed to ruptured bullae with a high risk of recurrence. A discussion with the patient was made for referral to a cardiothoracic centre however he declined referral. His refusal was understandable as he was a foreigner with both logistic and financial difficulties. CT of the chest was not done due to the same reason. His case was later discharged with a letter to his homeland hospital for further management without any follow-up news.

DISCUSSION

There are many possible causes when a patient presented with chest pain and breathlessness. The combination of these symptoms poses a challenge to doctor especially those working in the emergency department. Prompt, timely and appropriate intervention is lifesaving but in actual practice, this is not always the case. Often, emergency doctors are faced with patients with vague symptoms, at times history

is not obtainable due to patient's ill state (i.e. too breathless to speak) and overworked environment but needing prompt clinical acuity. Fortunately, in modern medicine, investigations have helps tremendously in diagnosing a patient's problem. CXR and ECG are mandatory in a patient with chest pain and breathlessness. Yet again, investigations are not without their errors in diagnosis.

ECG aids in detecting cardiac causes for a patient's symptom. For instance, in a patient with chest pain and breathlessness, ST-segment elevation in the ECG strongly indicates that patient is having an acute myocardial infarction. This needs to be coupled with typical history, physical findings and cardiac enzymes before treating as such. This is because ECG may show changes in non-cardiac diagnosis like pneumothorax. Literature has reported ECG changes in cases of pneumothorax[1, 3, 4]. Some of the ECG changes seen include electrical alternans, ST-T changes, bundle branch block morphology in pneumothorax[1]. There is also a case of ST-elevation morphology described for a patient with tension pneumothorax[5].

The detection of electrical alternans or phasic variation of QRS amplitude, in this case, has made us considered pericardial effusion and cardiac tamponade. However, the whole clinical picture was not compatible. He had a left tension pneumothorax and the electrical alternans seen earlier resolved following chest tube insertion, supporting the notion that the ECG changes were due to the pneumothorax. Bedside echocardiography after chest tube insertion revealed normal findings.

Even though ECG changes in tension pneumothorax have been well described in the literature, these encounters remain rare in actual clinical practice. This case report intends to highlight these findings to the medical fraternity, especially to junior doctors working as front liners.

Electrical alternans or phasic variation of QRS amplitude in pneumothorax has been attributed to possible changes of heart anatomy and volume with respiration[3]. In a large pneumothorax, there will be a mediastinal shift with the respiratory cycle. This shift of mediastinal structure may cause oscillation of the heart causing electrical alternans recorded on ECG.

CONCLUSION

This case report emphasizes the importance of considering history, physical examination, investigation in diagnosing and managing patient's clinical problem. All these diagnostic modalities are not absolute but rather complementary to each other. Doctors should have an open mind when dealing with patients in their daily practice as sometimes the presentation of common medical illness may be atypical from the norms, as illustrated in our case. Sound clinical judgement and decision save patient's life and this valuable quality is only achieved after years of clinical practice and reflection. ECG changes such as electrical alternans can be seen in tension pneumothorax as in this case.

CONFLICT OF INTEREST

The author declares that there are no competing interests in publishing this article.

CONSENTS

Verbal consent was obtained from the patient to publish the case with its related pictures. A copy of the written consent is available for review by the Chief Editor.

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CASE REPORT

Intractable Normal Anion Gap Metabolic Acidosis in a Patient with Diabetic Ketoacidosis

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Keywords: normal anion gap metabolic acidosis (NAGMA), high anion gap metabolic acidosis (HAGMA), diabetic ketoacidosis, diabetes mellitus

ABSTRACT

High anion gap metabolic acidosis (HAGMA) is a hallmark of Diabetic Ketoacidosis (DKA). Occasionally, a Normal Anion Gap Metabolic Acidosis (NAGMA) can be seen, especially during the treatment phase. In this case report, a 55-year-old lady with diabetes mellitus who presented with a 2-day history of fever, lethargy and multiple episodes of vomiting and diarrhoea. Initial laboratory investigations revealed: capillary blood glucose as 27 mmol/L, urine ketone as 3+, blood ketone as 3.5 mmol/L, serum bicarbonate as 14 mmol/L, and serum chloride as 95 mmol/L. She was treated with intravenous normal saline fluid resuscitation and constant rate insulin infusion which was fortunately accompanied by stabilization of blood glucose and normalization of blood ketone to 0.2 mmol/L. However, despite normalization of her anion gap (25 to 14), she remained unwell with acidotic breathing due to refractory hyperchloraemic NAGMA with bicarbonate at 11 mol/L and chloride of 112 mmol/L. It was then decided to administer 100 mL of 8.4% Sodium Bicarbonate solution. The next day, she was no longer tachypneic as her bicarbonate and carbon dioxide improved to 21 mmol/L and 32 mmHg respectively. The presence of NAGMA in DKA should prompt clinicians to conduct a thorough search for possible underlying causes, such as gastrointestinal fluid loss, sepsis and chloride load from aggressive fluid resuscitation with normal saline. Sodium bicarbonate should only be considered in intractable cases to correct a NAGMA and not routinely used in the treatment of DKA.

INTRODUCTION

Diabetic Ketoacidosis (DKA) is an acute life-threatening medical emergency that can be observed in patients with both type 1 and type 2 diabetes mellitus. It is characterized by the presence of hyperglycaemia, ketonaemia and a high anion gap metabolic acidosis (HAGMA)[1]. The accumulation of beta-hydroxybutyrates and acetoacetate leads to a high anion gap metabolic acidosis (HAGMA) in DKA. Interestingly, HAGMA can be changed to NAGMA during recovery and treatment phase. One of the reasons for developing NAGMA could be due to the loss of bicarbonate ions during the urinary excretion of ketones. The second reason could be the development of hyperchloremic metabolic acidosis (HMA)[2]. During recovery from diabetic ketoacidosis (DKA), many patients may eliminate the organic anions (through increased renal clearance and utilization) faster than their acidosis resolves. The clinical picture can resemble a normal anion gap acidosis. Excessive fluids with isotonic chloride levels may contribute to this acidemia[3].

CASE PRESENTATION

A 55-year-old lady with long-standing diabetes mellitus presented with a 2-day history of fever, lethargy, multiple episodes of vomiting and diarrhoea. Her diabetes had been managed with metformin and insulin due to poor glycaemic control. Other histories including travel history, sick contacts, family history, social history were largely unremarkable. On examination, she is alert, tachypneic, appeared ill, dehydrated and lethargic with a rapid heart rate (120 beats per minute, sinus tachycardia), and fever (temperature 38°C) Her peripheries were cold, and her mucous membranes were dry due to dehydration. Her initial laboratory investigations revealed: capillary blood glucose as 27 mmol/L, urine ketone as 3+, blood ketone as 3.5 mmol/L, serum bicarbonate as 14 mmol/L, and serum chloride as 95 mmol/L.

With the diagnosis in mind, she was transferred to a high dependency unit for close monitoring and further treatment. She was promptly treated with intravenous normal saline fluid resuscitation followed by a constant rate insulin infusion which fortunately accompanied by stabilization of blood glucose and normalization of blood ketone to 0.2 mmol/L. However, despite normalization of her anion gap (28 to 14), she remained unwell with acidotic breathing due to refractory hyperchloraemic NAGMA with bicarbonate 11 mmol/L and chloride of 112 mmol/L (Table 1). It was then decided to administer 100 mL of 8.4% sodium bicarbonate solution. The next day, she was no longer tachypneic as her bicarbonate and carbon dioxide improved to 21 mmol/L and 32 mmHg respectively.

Table 1 Blood investigation report of the patient

	Upon admission	Day 1	Day 2	Day 3	Day 4	Day 5
Sodium (mmol/L)	137	139	137	135	137	137
Potassium (mmol/L)	3.9	3.4	3.9	3.0	3.6	4.0
Chloride (mmol/L)	95	108	112	106	105	107
Hc03 (mmol/L)	14	15.3	11	18.3	21.6	23.4
Ph	7.21	7.29	7.32	7.49	7.48	7.50
Anion gap (mmol/L)	28	16	14	11	10	7

She was discharged well after 2 weeks of hospitalization upon completion of antibiotics for *Escherichia coli* bacteraemia which was cultured in peripheral blood. In-patient ultrasonography of the abdomen did not reveal any intraabdominal abscesses or collection secondary to *Escherichia coli* bacteraemia. She was well with good glycaemic control when she was reviewed back again at our outpatient clinic. Repeated blood gases were all in normal ranges.

DISCUSSION

DKA is classically linked to a HAGMA. However, a variable degree of NAGMA can occasionally be observed, more commonly during the treatment phase or among patients with DKA presenting late in the disease course[4]. The proposed mechanism of NAGMA in DKA is twofold. Firstly, in patients with DKA, there is a net urinary loss of bicarbonate in the form of keto-anions. In the early stages of less severe disease, most of these keto-anions are reabsorbed in the kidneys and metabolized to bicarbonate. This phenomenon is lost in severe cases or delayed presentations[5]. Secondly, during the treatment phase, NAGMA is aggravated by aggressive fluid resuscitation with normal saline[6]. Despite being widely used in fluid resuscitation, various studies have demonstrated that administration of large volumes of normal saline is associated with hyperchloraemia and hyperchloraemic metabolic acidosis.[6, 7].

We believe that the presence of NAGMA in DKA should prompt clinicians to conduct a thorough search for possible underlying causes, such as ongoing gastrointestinal fluid loss, sepsis and chloride load from aggressive fluid resuscitation with normal saline. This patient had multiple episodes of vomiting and diarrhoea that did not resolve until day 4 of admission. She was in sepsis secondary to *Escherichia coli* bacteraemia. Besides, she was initially resuscitated with large volumes of normal saline which led to the increment of serum chloride levels from 95 mmol/L to 112 mmol/L. The anion gap has normalised, however, she remained in metabolic acidosis. After administration of sodium bicarbonate solution, the metabolic acidosis has completely resolved. In another case report of a 21-year-old male, presented with DKA and subsequently progressed into hyperchloraemic NAGMA after being administered with aggressive fluid resuscitation of normal saline. In view that he remained in refractory metabolic acidosis, sodium bicarbonate was then administered. The next day, the acidosis has resolved[4]. In another retrospective analysis, delta ratio was calculated for all patients to study the metabolic acidosis. A delta ratio between 0.4 – 1 signifying mixed HAGMA and NAGMA, while a delta ratio of less than 0.4 signifying a pure NAGMA[5]. Calculation of the delta gap will help to identify concomitant metabolic alkalosis. Intravenous sodium bicarbonate is indicated when acidosis is due to a change in bicarbonate level (normal anion gap acidosis)[8].

Serum bicarbonate should not be used as a sole marker of DKA resolution as overzealous fluid resuscitation in the setting of refractory acidosis can lead to complications and adverse patient outcome. A retrospective analysis showed that even after the anion gap is closed with insulin therapy, NAGMA can persist. It would be prudent to use bicarbonate therapy in these situations[3]. NAGMA also can occur in the excretion of ketoacid in the urine, hence it can no longer be converted back into bicarbonate. Administration of sodium bicarbonate in this case is a logical therapy for NAGMA because this reflects a bicarbonate deficiency.

CONCLUSION

This case report demonstrated an uncommon but important phenomenon of DKA, which is a common medical condition. Physicians should focus on various mechanisms that might lead to a NAGMA in patients of

DKA. Clinicians need to be aware of this phenomenon to ensure an early diagnosis, better treatment and patient outcome.

CONFLICT OF INTEREST

The authors declare that they have no competing interests in publishing this article.

CONSENTS

Written consent was obtained from the patient to publish the case. A copy of the written consent is available for review by the Chief Editor.

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CASE REPORT

Unilateral Hemihyperhidrosis in a Stroke Patient and Literature Review on Its Clinicoanatomical Correlation

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Keywords: hyperhidrosis, stroke, sweating disorder, cardiovascular accident

ABSTRACT

Contralateral hyperhidrosis from the cardiovascular accident has been infrequently described in the stroke literature. The clinical significance and pathogenesis are yet well understood. This is a case of a 60-year-old man who developed excessive sweating of the paralyzed side with a pure division along the midline of the body secondary to a subcortical stroke, which region is supplied by branches of middle cerebral artery territory known as deep perforating lenticulostriate. To the best of our knowledge, a precise clinicoanatomic correlation between hyperhidrosis and subcortical stroke has not been widely reported. In this review, we summarize the existing literature of post-stroke hyperhidrosis to evaluate the correlation between clinical manifestation and its neuroanatomical location. According to the location of the infarction and clinical features, it can be concluded that both tracks en route through the ipsilateral internal capsule, after originating in the opercular cortex before crossing the brain stem and terminal connections with the contralateral thoracic spinal cord. Therefore, the phenomenon of hyperhidrosis in anterior circulation stroke might be postulated as due to the disruption of the sympathoinhibitory pathway that controls sweat glands, similarly like posterior circulation stroke.

INTRODUCTION

Sweating is physiologically controlled by two centres in the cerebral hemisphere: the hypothalamus and limbic systems, which regulate thermoregulation and emotional

sweating respectively[1]. Sweating dysfunction are ordinarily seen in neurological disease patients as autonomic disturbance[2]. Hypohidrosis or anhidrosis is a common form of the sweating disorder, seen after brain stem stroke[3] and cervical spinal cord injury[4] patients. It is ideally a presentation of Horner's syndrome which is go along with ptosis and ipsilateral miosis evidently linked to the lesions of sudomotor fibres in the uncrossed excitatory hypothalamospinal sympathetic path that supply the sweat glands[3]. On the other hand, an excessive sweating disorder called bilateral hyperhidrosis is seen in quadriplegics and high-level paraplegics after spinal cord injury[4, 5]. It is one of the clinical signs of autonomic dysreflexia and associated with other features of autonomic dysfunction such as pounding headache, flushing, goose flesh, bradycardia and high blood pressure[6]. Conversely, hyperhidrosis over half of the body is nowadays increasingly reported in posterior circulation stroke literature[3, 7 – 11]. The pathogenesis of this phenomenon was conjectured to the disruption of sudomotor fibres in the intersected inhibitory hypothalamospinal sympathetic path that supply the sweat glands. Unilateral hyperhidrosis secondary to anterior circulation cerebral infarcts is a rare clinical finding[12] and only limited studies have been found in patients with large cortical stroke involving the opercular cortex, cortical and subcortical structures[10, 12, 13]. Hyperhidrosis itself interferes with quality of life[14]. However, the clinical significance of post-stroke hyperhidrosis, involved structural lesion and pathogenesis are yet well understood[15]. Here, we present a case of a 60-year-old man who developed contralateral hemihyperhidrosis secondary to an anterior circulation stroke which involves the subcortical region supplied by deep perforating lenticulostriate branches of middle cerebral artery territory. To the best of our knowledge, a precise clinicoanatomic correlation between hyperhidrosis and anterior circulation subcortical stroke has not been widely reported. In this review, we summarize the existing literature of post-stroke hyperhidrosis to evaluate the correlation between clinical manifestation and its neuroanatomical location.

CASE PRESENTATION

A 60-year-old Chinese Malaysian man presented with sudden onset of left-sided facial and body weakness. Otherwise, there are no other symptoms such as loss of consciousness, slurred speech, blurred vision, headache, nausea, vomiting. He had a history of diabetes mellitus and hypertension for 6 years. However, he defaulted treatment and missed medications off and on for the past 10 months. Furthermore, he also had a lacunar stroke last 10 years ago with no residual weakness and full recovery. He also has Alzheimer's disease but not under any treatment. He works as a supervisor in a logging company. He is a chronic smoker for 20 pack-year and ex-alcoholic consumer. He is currently on oral Atenolol 100 mg, Amlodipine 10 mg and Perindopril 8 mg for hypertension, Gliclazide 60 mg, Metformin 1 gram, Saxagliptin 5 mg and subcutaneous injection of Actrapid 10 unit for diabetes mellitus, oral Aspirin 150 mg and Atorvastatin 40 mg.

Upon arrival at the emergency department, he was fully conscious, and peripheries were warm with good pulse volume. Pupils were 2/2 reactive. Vital signs were blood pressure 182/112 mmHg, pulse rate 72/min, respiratory rate 16/min, temperature 36.8°C and oxygen saturation of 99% under room air. Neurological examination showed facial asymmetry with loss of left nasolabial fold and reduced muscle strength (Medical Research Council Grade III) over the left upper and lower limbs. Otherwise, the other cranial nerves were intact. There were no cortical signs present. In addition, tone and reflexes were reduced as well as extensor plantar response was elicited over the left side of the body. The sensation was intact and cerebellar sign was negative. Laboratory findings were

normal except hypercholesterolaemia and hyperglycaemia. Non-enhanced computerized tomography scan of the brain showed ill-defined hypodensities at the right internal capsule with no haemorrhagic transformation which is compatible with clinical findings of left-sided body weakness (Figure 1).

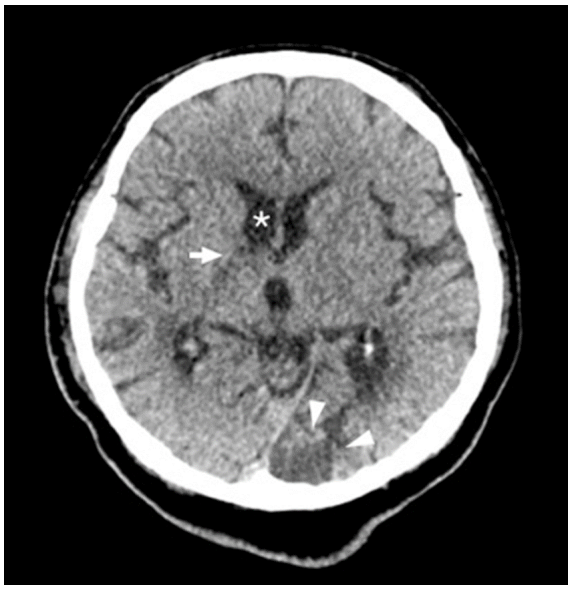

Figure 1 Axial section of non-enhanced Computerized Tomography brain scan at the level of the basal ganglia. Ill-defined hypodensities at the right internal capsule (arrow) with ex-vacuo dilatation of the anterior horn of the right lateral ventricle (Asterix) which is suggestive of right acute on chronic anterior circulation subcortical infarct. There is also a fairly well-defined hypodensity at the left occipital lobe (arrowheads) with a relatively dilated occipital horn of left lateral ventricle, suggestive of a left subacute posterior circulation artery infarct.

Despite the subacute occipital lobe infarct appearance in CT brain, there were no posterior circulation stroke signs and symptoms. Alberta stroke program early CT score (ASPECTS) was 8. MRI brain could not proceed due to financial constraint. He was diagnosed as acute anterior circulation subcortical stroke and treated with aspirin and atorvastatin. Subsequently next day after admission, drenching sweats were documented over the left side of the body especially face, arm and upper torso. There was no previous history of similar symptoms. Furthermore, there was no evidence of autonomic or hypothalamic dysfunction. One month after physiotherapy, the patient was still hemiplegic (muscle strength over the right side of the body improved to 4/5) with the return of sweat function back to normal.

DISCUSSION

Contralateral hyperhidrosis is rarely reported in the stroke literature, with an incidence around 1% in thalamic[16], hypothalamic[17], pontine[7 – 9, 18], medulla oblongata[10, 11], and cerebral hemispheric[10, 12, 13] infarction. However, it has received scant attention in hemiplegic patients after subcortical stroke. The pathogenesis and clinical significance of hyperhidrosis in a patient with stroke are still uncertain[15, 19]at 1 month, and at 6 months after infarction. Excessive evaporation on the paretic side when compared with the nonparetic side was already found at baseline, but after the heating stimulus, this asymmetry reached statistical significance on the forehead, chest, forearm, and hand during the whole 6-month follow-up. Significant asymmetry in sweating occurred in 29 of the 40 patients (73%.

Six unilateral hyperhidrosis cases have been found primarily out of 633 consecutive strokes, particularly in the scenario of the anterior circulation occlusion by Labar[13]. Out of six, two cases were localized infarctions of the opercular cortex, and the rest four cases were large cortical infarcts. Korpelainen[15]at 1 month, and at 6 months after infarction. Excessive evaporation on the paretic side when compared with the nonparetic side was already found at baseline, but after the heating stimulus, this asymmetry reached statistical significance on the forehead, chest, forearm, and hand during the whole 6-month follow-up. Significant asymmetry in sweating occurred in 29 of the 40 patients (73% reported that it can

also be the result of lesions of the premotor cortical areas affected in anterior circulation stroke. On the grounds of studies in human[13] and animal[20, 21], the researchers conjectured the pathogenesis of hyperhidrosis as the disruption of sudomotor fibres in a putative crossed inhibitory hypothalamospinal sympathetic pathway that originates from the cerebral cortex, probably the operculum, then trespassing through the ipsilateral thalamus, hypothalamus, pons and medulla, ultimately crossed in the inferior brainstem and terminated in the contralateral thoracic spinal cord[3, 10, 16, 17, 22]. This pathway inhibits sudomotor neurons resulting in over sweating of the contralateral face and body. It has also been suggested that the pathways follow the pyramidal tract[10, 23]. Therefore, emerging evidence showed the degree of hyperhidrosis in stroke patients are correlated with the presence of significant neurological disability regardless of the size and location of ischaemic brain lesion[24]pathogenesis, and clinical correlates of sweating dysfunction in stroke. Methods: We studied sweating at baseline and after a heating stimulus in 53 patients with acute hemispheral brain infarction and in 40 healthy control subjects by using a quantitative evaporimetric method. Results: Significant hyperhidrosis on the paretic side of the body was verified in 55% of the patients at baseline, in 74% after 5 minutes of heating, and in 77% after 10 minutes of heating. Hyperhidrosis was established throughout the body and correlated with the severity of paresis, the presence of reduced muscle tone, and the extensor plantar response. Conclusions: The phenomenon of hyperhidrosis in hemiparetic patients reflecting autonomic dysfunction seems to be a common manifestation that should be listed among the expected consequences of brain infarction. This sweating disturbance might be attributed to a lesion of a putative sympathoinhibitory pathway controlling sweating. The failure of this pathway could also be related to other manifestations of sympathetic hyperfunction, e.g., cardiac complications. Therefore, assessment of sweating may provide a new, important aspect in the evaluation of stroke patients. (Stroke 1992;23:1271-1275. As such, Laber[13] affirmed that it is related to increased mortality. Contradictorily, Korpelainen et al. (1992)[24]pathogenesis, and clinical correlates of sweating dysfunction in stroke. Methods: We studied sweating at baseline and after a heating stimulus in 53 patients with acute hemispheral brain infarction and in 40 healthy control subjects by using a quantitative evaporimetric method. Results: Significant hyperhidrosis on the paretic side of the body was verified in 55% of the patients at baseline, in 74% after 5 minutes of heating, and in 77% after 10 minutes of heating. Hyperhidrosis was established throughout the body and correlated with the severity of paresis, the presence of reduced muscle tone, and the extensor plantar response. Conclusions: The phenomenon of hyperhidrosis in hemiparetic patients reflecting autonomic dysfunction seems to be a common manifestation that should be listed among the expected consequences of brain infarction. This sweating disturbance might be attributed to a lesion of a putative sympathoinhibitory pathway controlling sweating. The failure of this pathway could also be related to other manifestations of sympathetic hyperfunction, e.g., cardiac complications. Therefore, assessment of sweating may provide a new, important aspect in the evaluation of stroke patients. (Stroke 1992;23:1271-1275 and Kim et al. (1995)[10] claimed the presence of hemihyperhidrosis in stroke patient is not a sign of poor prognosis.

Some studies concluded that ischaemic brain infarction almost inevitably damages the autonomic nervous system. It is because central autonomic network (CAN) is located around the insular cortex, amygdala, hypothalamus, medulla, periaqueductal grey matter, parabrachial complex and nucleus of tractus solitarius[25]. Damage to these regions due to brain injury could cause loss of cortical inhibition of the hypothalamus resulting in

increased contralateral sympathetic outflow. The failure of this inhibition can be related to manifestations of paroxysmal sympathetic hyperfunction, e.g. tachycardia, hyperthermia, vasodilation in addition to hyperhidrosis[24]. However, we believe none of those CAN regions have been affected by stroke according to the imaging finding which in accord with the absence of other associated autonomic dysfunction features.

According to one of the case reports of a pure hypothalamic stroke patient, hyperhidrosis phenomenon was possibly explained that due to the fact of hypothalamus receiving its blood supply from the posterior cerebral artery, hypothalamus being a central thermoregulatory centre is responsible for the hyperhidrosis in this posterior circulation stroke patient[3, 17, 22]. Bassetti (1995)[3] reported the combination of both contralateral hemihyperhidrosis and ipsilateral anhidrosis happened in a posterior circulation occlusive disease patient where anterolateral midbrain, ventroposterolateral thalamic-subthalamic and temporo-occipital lobes were affected. Therefore, it was speculated that the thermoregulating fibres descend in the ventroposterolateral thalamic-subthalamic area, anterolateral midbrain, dorso-lateral part of the pontine tegmentum and the lateral reticular formation in the medulla[7]. Likewise, Kim et al. (1995)[16] reported that pure thalamic infarction is also associated with persistent contralateral hyperhidrosis due to sharing of the same crossed inhibitory sweating pathway.

In spinal cord disorder patients, the mechanism of hyperhidrosis has been due to the activity of isolated disinhibited spinal cord. A specific stimulus such as the bladder or rectum distension triggered episodic and transient hyperhidrosis above the level of spinal cord lesion mostly associated with cutaneous flushing, headache, hypertension and reflex bradycardia. However, unlike spinal cord injury, hyperhidrosis seen in stroke patients are not commonly found to be associated with such autonomic dysfunction[10, 13, 19]. Nevertheless, the literature review shows post-stroke hyperhidrosis can be spontaneous or provoked by stress, exercise, infection, heat exposure or effort[9, 11, 17]. In our patient, it was noted to have no instigating factor for hyperhidrosis.

In most of the stroke cases, unilateral hyperhidrosis was limited to the contralateral side of the body and typically involved face, arm and upper torso. The onset of the symptom varies from few days[3, 10, 17, 22] to months[11, 18] later after infarct and duration of symptoms are typically transient, lasting for few days[13], weeks[7, 18], months[10] up to years[9, 17, 22]. In our patient with pure motor stroke, unilateral sweating appeared on the second day of stroke and lasted for one month. According to a prospective study of hemihyperhidrosis patients among hemispheric brain infarction by Korpelainen et al. (1993)[15] at 1 month, and at 6 months after infarction. Excessive evaporation on the paretic side when compared with the nonparetic side was already found at baseline, but after the heating stimulus, this asymmetry reached statistical significance on the forehead, chest, forearm, and hand during the whole 6-month follow-up. Significant asymmetry in sweating occurred in 29 of the 40 patients (73%, asymmetry sweating was observed in 73% of patients in the acute phase of infarction, 56% after 1 month and 85% after 6 months. In term of management, most post-stroke hyperhidrosis cases do not require treatment as it is a benign and self-limiting disorder[12]. Awada et al. (1991)[26] inferred that the duration of hyperhidrosis may be related to the site of the nervous lesions and compensatory mechanisms are much stronger in higher lesions.

In this case, the patient presented with left facial involvement (loss of nasolabial fold, drooling of saliva and facial asymmetry) and left-sided hemiparesis. Also, the patient suffered from left-sided hyperhidrosis mainly over the face, arm and upper trunk after the

acute stroke. Noted that, in CT shows an acute right internal capsule infraction. The mapping of this lesion is to the involvement of deep subcortical structures which are both supplied by the lenticulo-striate branches of the middle cerebral artery. The presentation of contralateral hemihyperhidrosis secondary to internal capsule infarction supports the hypothesis of the existence of the putative inhibitory sympathetic pathway. Notably, there was no literature confirmed the pathway of inhibitory sympathetic pathway en routing through the internal capsule alongside with pyramidal tract as the pathogenesis of unilateral hyperhidrosis in a subcortical patient. This hypothesis can be supported by the previous study in that an association was found between hyperhidrosis and pyramidal tract lesion.

It can be also debated whether the hyperhidrosis is contributed by any medication or underlying medical illness. A study done by Akbas and Kilinç (2018) found out that there was an association between hyperhydrodrosis and diabetes mellitus (25.7%) as well as antidiabetic agents (14.2%)[27]. Furthermore, hyperhidrosis secondary to medication is more common to have generalized sweating rather unilateral. In that study, clinical types of secondary hyperhydrorosis frequently detected are palmoplantar and axillary regions, followed by forehead. However, in our case, the patient had defaulted medication and the unilateral hyperhidrosis was acute onset which occurred only after the stroke.

CONCLUSION

Profuse sweating on paresis side of the body is one of the sequels of the cerebral hemispheric infarction. The clinicians should be attentive of unilateral hyperhidrosis, although it is a transient feature affecting especially face, arm and upper torso in stroke patients. This case was reported with the hope of increasing awareness and recognition of underreported hyperhidrosis in stroke cases. To conclude, the acute internal capsule infarction damages corticopyramidal tracts as well as inhibitory sympathetic pathway resulting in contralateral hemiparesis and excessive sweating. According to the location of the infarction and clinical features, it can be concluded that both tracks en routing through the ipsilateral internal capsule after originating in the opercular cortex before crossing the brain stem and terminal connections with the contralateral thoracic spinal cord. Therefore, the phenomenon of hyperhidrosis in anterior circulation stroke might be postulated as due to the disruption of the sympathoinhibitory pathway that controls sweat glands, similarly like posterior circulation stroke.

CONFLICT OF INTEREST

The authors declare that they have no competing interests in publishing this article.

CONSENTS

Written informed consent was obtained from the patient to publish the case with its related pictures. A copy of the written consent is available for review by the Chief Editor.

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CASE REPORT

Galactorrhoea in a Toddler: A Rare Report

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ABSTRACT

Milk discharge from neonatal breast commonly occurs bilaterally. Majority of them are benign in nature. Those cases usually require conservative management and will resolve with time. It typically occurs within one month of age in which late-onset of galactorrhoea in toddlers is indeed a rare occasion. Thus, an abnormal cause needs to be ruled out. An 18-months-old child had persistent milky discharge from the left nipple for several days without underlying specific identified causes. This case highlights the occurrence of physiological milk discharge can still possibly occur at the age beyond one-year-old despite its absence in the initial months of life. The principle observation at primary care is still adequate in managing such cases unless high suspicion of alarming disease arises. This case proved a late onset of physiological galactorrhoea can still occur in the early toddler age group.

INTRODUCTION

Galactorrhoea refers to the condition of abnormal secretion of breast milk in a situation other than physiological breastfeeding[1,2]. It can occur either unilaterally or bilaterally, profuse or sparse in amount, and sudden or gradual in onset. Secondary galactorrhoea occurs most commonly in adults and rarely happen in children[3]. Among the causes of secondary galactorrhoea includes taking drugs such as antihypertensive or antipsychotics, oral contraceptive pills, chronic kidney disease, nipple stimulation or even tumour such as

pituitary adenoma and prolactinoma[1, 2]. These are rare in children. Meanwhile, witch's milk, a condition associated with larger than average breast nodules, is a common occurrence in neonates of either sex and usually does not persist beyond two months of age. It is related to the trans-placental transfer of maternal hormones to the foetus, which is expected to be resolved with time. Thus, galactorrhoea in a toddler without palpable mass is, in fact, a rare occurrence in which other pathological causes need to be ruled out including the possibility of a pituitary tumour or congenital disorder of the breast[1 – 3].

CASE PRESENTATION

This is the case of unilateral galactorrhoea that occurred in an 18-month-old girl who had no prior illness or relevant medical and birth history. The child was brought in by her mother during a routine immunization schedule at our health clinic. The mother had noticed a persistent milky discharge from the baby's nipple for several days. The discharge was whitish and odourless with no swelling, palpable mass or redness surrounding the nipple. The child also had no fever. The child was born full-term by means of spontaneous vaginal delivery with a birth weight of 2.95 kg without any significant illness. The child was exclusively breastfed until six months of age and is thriving well. Her mother did not take any traditional postnatal herbs or any over the counter medication or supplements. She also did not practice any massage over her baby's nipple. There were also no other associated alarming symptoms such as vomiting or irritability.

On examination of the left nipple, there was persistent milky thin discharge spontaneously came out from the nipple (Figures 1 and 2). There were no erythematous skin areas seen. The nipple bud was not tender and not warm on palpation. There was no obvious palpable mass and no axillary lymphadenopathy was seen.

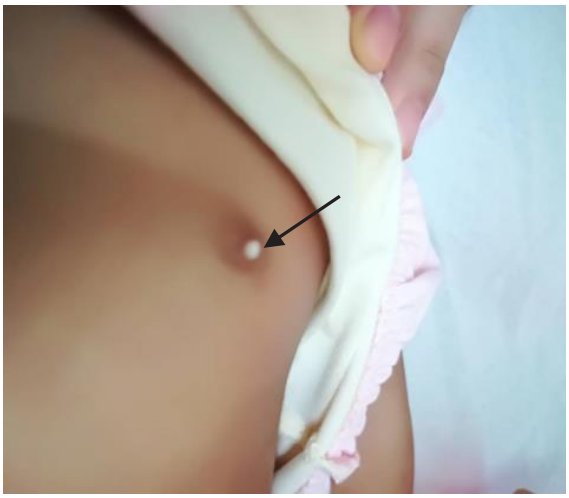

Figure 1 Prominent galactorrhoea from the bud of the left nipple

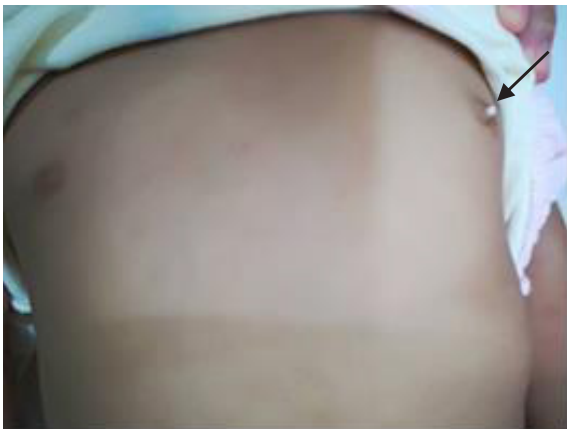

Figure 2 Unilateral galactorrhoea without any other abnormalities seen

In view of her late and atypical presentation, we seek an opinion from a paediatrician and a sample was sent for serum prolactin. The result turns out to be within a normal range. We continue to follow up the child at our centre with shared care from a paediatrician. The child condition was stable throughout the visit. The parents were reassured and keen for conservative management at our centre. Surprisingly, it took two months for the condition to be completely resolved at her age of two years old during the follow-up.

DISCUSSION

It is a predicament for a clinician to proceed with a further investigation or otherwise for a child that presents with atypical presentation of a common disease[4, 5]. Nevertheless, there is always an individualized role of performing a simple point of diagnostic test that can differentiate from a life-threatening disease and benign disease at the primary care setting[4, 5]. In this case, we decided for serum prolactin measurement as one of the assessment tools in view of the atypical age of the presentation, persistent nature of the milk discharge and lack of local lesion or palpable mass surrounding the nipple[3].

One of the strengths of the primary care setting is the ability to perform close monitoring at a community level of care[6]. The main clue of the benign nature of this disease is the long duration of galactorrhoea that we had observed in this child up to two months under our follow up without the development of other new clinical signs[3, 6]. This favour the possibility of an underlying benign condition rather than pathological causes. Furthermore, there is no presence of blood-stained discharge or other systemic symptoms such as fever or weaknesses[1, 2, 3, 6]. The child is thriving well with good weight gain and good developmental milestone progress according to her age.

There is no specific reason why witch's milk can present late at the age of 18 months old[7, 8]. One of the possible reasons is the possibility of high oestrogenic-like nutrition from the mother's breast milk that the child had consumed[7, 8]. This is closely related to the type of diet that the mother eats every day. However, further history from the mother revealed that the mother did not consume any new diet pattern or taking supplements or herbs[5, 6]. The mother also denied any habitual massage or a frequent touch of the child's nipple that contribute to the recent galactorrhoea[5, 6]. It is still unknown, and it requires further proper clinical study to identify the best associations. Thus, the term idiopathic galactorrhoea would be the best to describe this case as there were no clinical features associated with hypothyroidism or metabolic disorders, even though not all investigations have been performed[7, 8]. The child's breast tissue may have increased sensitivity to the normal circulating prolactin levels[5, 6]. Nevertheless, one of the strongest points to support maternal diet, in this case, is that the child's condition resolved upon stopping consuming breastmilk towards the age of two years old.

Management of galactorrhoea in children is mainly an observation[5, 8] However, what more important is to educate and reassure the parents that the condition is normal. Most parents would feel worried especially when there is no similar experience among other children. In our case, open discussion with the mother including an explanation on the possible alarming symptoms and sign that the mother should aware while at home to seek attention has reduced her worries. Advise seeking and sharing decision with a paediatrician is indeed important. Even the mother refused for admission and follow up at a tertiary centre due to logistic reason, continuous input from a paediatrician can always be sought by effective communication between the family medicine specialist and paediatrician. Performing a shared decision on observation time before surgical intervention referral is indeed a good approach in our setting. We agree to give time up to two years old, which does not exceed in this physiological case. This can reduce excessive worries, the burden of multiple centre visits by the caretaker and excessive invasive procedures to the child.

CONCLUSION

Witch's milk is still possible in an older age group of children. It is still acceptable to keep observe the child at a primary care clinic provided there is no alarming symptoms or

signs noticed during the follow up as long as a continuously shared decision is made with a paediatrician and a tertiary centre. Further study is needed to understand the underlying cause that leads towards such a rare presentation of a physiological galactorrhoea.

CONFLICT OF INTEREST

The authors declare that they have no competing interests in publishing this article.

CONSENTS

Written informed consent was obtained from the patient's mother to publish the case. A copy of the written consent is available for review by the Chief Editor.

ACKNOWLEDGEMENTS

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CONCEPT PAPER

Implementing Uberization in Malaysian Healthcare Services

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Keywords: uberization, healthcare, phone application, mobile technology, on-demand services

ABSTRACT

Getting appropriate healthcare is a challenge to the citizens in Malaysia due to the limited facilities, healthcare providers, and cost of healthcare. Uberization of healthcare will help fill this gap. Uberization helps modify the market or economic model with the introduction of a cheaper and more effective alternative service by introducing a different way of buying or using it, with the use of mobile technology. With powerful artificial intelligence engines operating on cloud servers, mobile apps can provide a better healthcare experience for patients. With uberization application, the patient need not come to the hospital to see a doctor before a treatment can be planned. Once a request is made by the patient, the healthcare providers can come to see the patient at an agreed place. This article aims to explore the possible uberization of healthcare in Malaysia.

INTRODUCTION

Uber is a ridesharing system which was made possible by the development of GPS, smartphone technology and electronic payment[1]. Uber, which was founded in 2009, initially started in San Francisco, and now operates in more than 300 cities around the world[2]. This software will connect the drivers and vehicles with the consumers who want rides at an agreed price. This phone application also provides information on the location of the driver and the waiting time. A payment system, either with cash or credit card, will be used to complete the transaction.

Incidentally, the term Uberization was coined from this growing industry. Uberization means to modify the market or economic model by the introduction of a cheaper and more effective alternative[3] or to change the market for service by introducing a different way of buying or using it, with the help of mobile technology[4]. The idea behind uberization is providing on-demand services for as many needs as possible, such as food, transportation and other services.

Challenges with Our Current Healthcare System

The Malaysian healthcare system is a dichotomous public-private system[5], both striving with their objectives. The public sector provides about 82% of inpatient care and 35% of ambulatory care, but the private sector provides about 18% of inpatient care and 62% of ambulatory care[6]. However, due to the limited facilities, healthcare providers, and cost of healthcare, getting appropriate healthcare has been a challenge to the average citizens in Malaysia.

The Ministry of Health has a healthcare facility within 5 km radius, which caters to all including the rural population. However, not all are fully equipped with well-trained healthcare providers or with adequate facilities[7]. Tertiary hospitals too were expanded but were troubled by understaffing. The population growth in any country has always outbalanced healthcare planning, and this has become a big concern.

In this current age, the life expectancy of men and women all around the world has increased, and along with it, chronic diseases. In Malaysia, the life expectancy at birth in 1957 was 55.8 years for men, and 58.2 years for women[8]. In 2018, it increased to 72.7 and 77.6 years respectively[9]. However, the cost of medical healthcare became expensive. Many countries depend heavily on patients' out-of-pocket payments to providers to pay for their healthcare. This prevents some people from seeking care. Several surveys in eighty-nine countries covering 89 per cent of the world's population suggest that 150 million people globally suffer financial catastrophe annually because they have to pay for the health services[10].

The main disease burden in Malaysia has shifted in recent years from communicable to non-communicable diseases (NCDs). In 2015, the prevalence for adults with hypertension was 30.3%, hyper-cholesterolaemia 47.7%, diabetes 17.5%, overweight and obesity 47.7%, tobacco use in men 43%, physical inactivity 33.5% and mental health problems 29.2%[11]. The rising healthcare cost has made it difficult for patients to physically present themselves to clinics or hospitals to be seen and evaluated by healthcare providers.

We believe uberization of healthcare will certainly help overcome this situation.

Possible Implementation of Uberization of Healthcare

Healthcare services can be broadly divided into emergency services and non-emergency services. Emergency services can include patients with loss of consciousness, chest pain or difficulty breathing. These sorts of cases require immediate medical care, and best be assisted with ambulance services or an urgent visit to the Emergency Department. Non-emergency cases, unlike emergency cases, do not need immediate attention from healthcare providers. These include follow-up cases, immunization and routine blood investigations.

For uberization of healthcare to be successful, a clear definition must be understood by the patients. This is because the flow of request is different, and the response by healthcare providers is also very much different.

The first step in Healthcare Uber request is to identify either it is an emergency case or not. For that to happen, the healthcare provider managing the application must set ~~in~~ clear options, for patients to decide on. After the emergency or non-emergency case has been classified, then the appropriate response can be implemented.

In an emergency case, the application will notify the ambulance to be dispatched immediately to attend to the patient. While en-route, the healthcare providers will prepare appropriate medications and equipment, which will help them provide immediate treatment when seeing the patient.

In a non-emergency case, the ambulance will be dispatched, but at a scheduled time agreed both by the patient and the healthcare provider. For example, if the patient would request routine blood taking to check his blood sugar, he can set a time after he has fasted appropriately, and the healthcare provider will be there at the agreed time and place. The results will be then sent to the patient via WhatsApp or email, without the patient ever needing to come to the hospital. This result will be validated by the doctor, and appropriate advice given. If needed, the patient will be advised to come to the hospital for further consultation and appropriate physical examination.

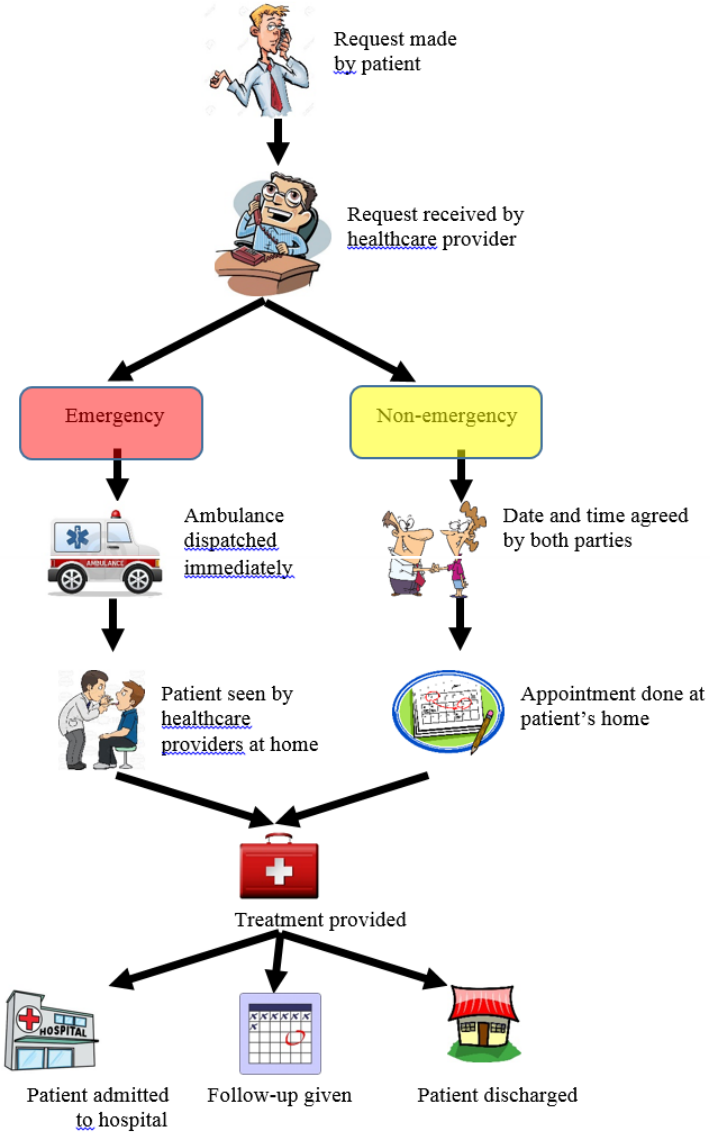

Figure 1 Flow of Uberization process **How can Uberization be Practiced in Malaysia?**

In Malaysia, the percentage of internet users continues to rise year after year. The percentage of internet users rose from 76.9% in 2016 to 87.4% in 2018. In 2018, urban users made up for 70% of internet users, while rural users accounted for 30%[12]. This is a very good indicator to start uberization in Malaysia.

To have a healthcare service which practices the uber concept, a platform of a mobile application is needed. That application must be ideally be loaded on both the IOS and Android platform and should be free to download. The application must be user friendly, and registration of basic information such as identification data, location of residence and emergency contact number must be done prior to use. It would be better if the application is linked to a nearby hospital database, where healthcare data like known medical problems and medications are easily available especially to the healthcare uber provider. This is of utmost importance, especially for doctors and nurses to identify the possible cause of the patients' medical problem. For example, if a diabetic patient requested a uber for dizziness, the attending doctor would suspect hypo or hyperglycaemia, and prepare accordingly while attending the patient.

The application must also be able to accept multiple moods of payment. This includes credit cards, online banking as well as cash.

The application must also have a good navigation system, to enable the patient to pinpoint his or her exact location. Now, applications like Waze and GoogleMaps are excellent. Instead of creating a new navigation system, the Healthcare App should be affiliated with one of these navigation applications. The app must also be able to lock and save the patients address for fast and accurate location identification, especially during an emergency.

The healthcare app must have room for both patients and healthcare providers to provide feedback on each other. The patient's feedback will be valuable to improve the services of the ambulance and attending healthcare providers. Feedback from the attending healthcare providers will be important for us to be better prepared if the patient requests again in the near future.

Benefits from the Uberization of Healthcare

Any nation's healthcare aim is to provide high quality, accessible, and low-cost healthcare[13]. It is the decisions, plans and actions undertaken to achieve specific healthcare goals within the society and it plays an essential role in defining the country's vision, priorities, budgetary decisions and course of action for improving and maintaining the health of its people[14].

The diagnostics and treatment abilities of physicians could be amplified by mobile medical apps. With powerful artificial intelligence engines operating on cloud servers, mobile apps can provide a better healthcare experience for patients. With uberization application, the patient need not come to the hospital to see a doctor before a treatment can be planned. Once a request is made by the patient, the healthcare providers can come to see the patient at an agreed place. The uber request could also bypass the referral process usually done in our current system, and therefore eliminates the time process for a patient to see the relevant medical expert after a problem has been mentioned in the application. The mobile healthcare can be used to eliminate preventable human errors, thus promoting evidence-based decision making. This would ensure high-quality healthcare.

The difference in our current healthcare services and uberization of healthcare is compared in Table 1.

Table 1 The difference between the current healthcare and the uberization of healthcare

Aspect	Current healthcare	Uberization of healthcare
Waiting time	Long waiting time for services	Service on demand
Logistics	Transport needed to seek services	Services will come to the patient
Need for referral	Referral needed	Self-referral
Time of decision for treatment	Decisions can only be made on arrival at the hospital	Initial decisions can be made before the patient arrives at the hospital

It is believed that with the uberization of healthcare, the people will benefit the most.

CONCLUSION

The uberization of healthcare in Malaysia is an uphill task. The success of it will require teamwork of healthcare providers, the application developers and the willingness of patients to try a new method of healthcare service. At the present rate of technology growth in the world, uberization of healthcare will eventually be a reality. It's just a matter of when and where.

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CLINICAL QUIZ

Intramural Gas: Would it be Life-threatening?

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QUESTION

A 74-year-old gentleman, an active smoker with no known comorbidities, presented with 4 days history of abdominal discomfort and distention with additional 2 days history of nausea and vomiting. He had no constitutional symptoms. He was independently active. On examination, he was conscious, oriented, cachexic looking and dehydrated. He was tachycardic but normotensive. The abdomen was distended with no peritonitis. Bowel sound was sluggish. Digital rectal examination revealed a mass, felt 3 cm from the anal verge. It was friable and bled on touch. The urine was concentrated with an output of 0.5 mL/kg/hour. Blood investigation demonstrated neither leukocytosis nor lactic acidosis. He was pushed for contrast-enhanced computed tomography (CECT) scan of the abdomen and the imaging views are as shown in Figure 1 (axial view) and Figure 2 (coronal view). Please interpret the figures and suggest the provisional diagnosis.

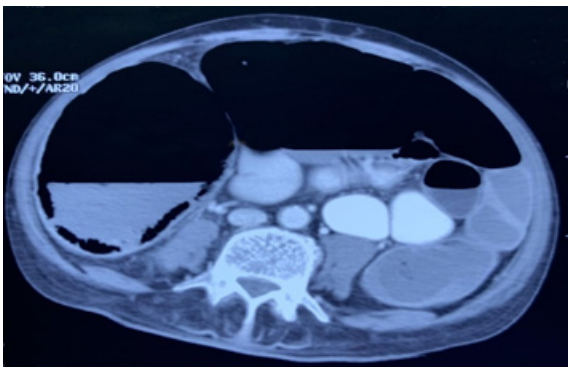

Figure 1 Axial image of CECT of the abdomen

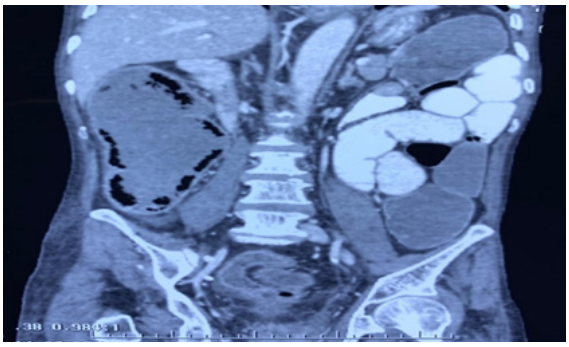

Figure 2 Coronal image of CECT of the abdomen

Please find the answer in the next issue.

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LETTER TO EDITOR

Response to: Prurigo Nodularis and Hodgkin's Lymphoma – A Rare Association

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Dear editor,

We read with great interest the article by Go ZL et al., which was published in your esteemed journal[1]. The authors had reported an unusual and yet important case of cutaneous manifestations of malignancy. Being the only and initial presentation of Hodgkin's lymphoma, prurigo nodularis can manifest as a benign dermatological appearance in the underlying sinister condition. We want to again highlight the importance of this bizarre cutaneous presentation which can counterfeit the actual and occult villain.

Paraneoplastic dermatoses are daunting to the attending physician. It is defined as dermatological manifestations of hormonal, neurological or haematological disturbances in relation to the presence of malignancies without direct association with either primary or secondary tumour invasion[2]. Curth's criteria can be utilized to diagnose cutaneous paraneoplastic syndromes. These criteria include (1) simultaneous occurrence of both neoplasia and paraneoplasia, (2) regression of the skin lesion after disease treatment, (3) lack of association between the skin lesions and genetic syndrome, (4) there is a specific type of neoplasia that occurs with paraneoplasia, (5) the dermatosis is rare in the general population, and (6) there is a high frequency of association between both conditions[2].

There are numerous reported discoveries of paraneoplastic dermatoses in the literature[2]. Among these, there are surgically important entities that intrigue the attending surgeons such as acanthosis nigricans (AN), Leser-Trélat syndrome (LTS) and Bazex syndrome (BS). The AN is featured as a thickening and darkening of the skin which can appear around the skin folds, scalp, back and front of the abdomen[4]. The skin lesions disappear following total gastrectomy followed by adjuvant chemo-radiotherapy. Meanwhile, LTS is characterized by the eruptive appearance of multiple seborrheic keratoses on the body[5]. It is associated with underlying malignant diseases namely colon, breast, stomach, and also the lung, kidney, liver, and pancreas[6]. BS is defined by the presence of symmetrical papulosquamous eruptions (psoriasiform cutaneous eruptions), nail dystrophy and skin scaling usually localized in the body extremities[7]. It is associated with squamous cell carcinoma (SCC) of the head and neck, particularly of the oral cavity, oropharynx, larynx and oesophagus.

Recognising cutaneous manifestation of internal malignancy can be challenging given the wide differentials of any given abnormal skin morphology associated with systemic symptoms. Take for example Sweet Syndrome (SS); characterised by the sudden appearance of tender, erythematous and oedematous cutaneous papules, plaques or nodules that are often accompanied with fever and leukocytosis[3]. Although malignancy-associated SS contributes to a significant percentage of cases, other causes of SS such as infection, inflammatory diseases and drug-induced skin disorders should be ruled out to raise the index of suspicion for an associated internal malignancy[4].

An important key to prompt recognition is, therefore, the awareness and recognition of some of the typical paraneoplastic dermatoses which may lead to the early diagnosis of a neoplasm and subsequently the establishment of early treatment. As highlighted by Curth's criteria, most paraneoplastic dermatoses disappear when the primary tumour is removed and reappear in the case of recurrence or metastases. Surgical skin biopsy usually provides a benign histological diagnosis in the background of occult malignancy.

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ORGANIZATION OF THE MANUSCRIPT

The length of the original articles, excluding References, should not normally exceed 2700 words. Brief and case reports are inevitably shorter. Manuscript should contain the following sections in the order listed.

Title Page, carrying the following information:

The title of the article. Concise titles than long, convoluted ones. Titles that are too short may, however, lack important information, such as study design (which is particularly important in identifying randomized controlled trials). Authors should include all information in the title that will make electronic retrieval of the article both sensitive and specific.

Authors names and institutional affiliations.

Name of the department(s) and institution(s) to which the work should be attributed.

Corresponding author. Name, mailing address, telephone and fax numbers, and e-mail address of corresponding author.

Abstract

Abstract should be one paragraph, without sections and provide information on: **Background/ objective** of the study, **Materials and Methods** used (selection of study subjects or laboratory animals, observational and analytical methods etc.), **Results** (main findings giving specific effect sizes and their statistical significance, if possible), and **Conclusion** (it should emphasize new and important aspects of the study or observations). Altogether, abstract should not exceed 250 words. Do not usereference citation in Abstract.

Keywords

The authors should provide 3 to 5 keywords for indexing purpose. These words have to be selected from the terms recommended in the last version of the Medical Subject Headings (MeSH) (http://www.nlm.nih.gov/mesh/meshhome.html).

INTRODUCTION

It should provide the background of the study (i.e., the nature of the problem and its significance). State the specific purpose or research objective, or hypothesis tested, the study or observation; the research objective is often more sharply focused when stated as a question. Both the main and secondary objectives should be made clear, and any pre-specified subgroup analyses should be described. Only exact pertinent references should be provided and do not include data or conclusions from the work being reported.

MATERIALS AND METHODS

This section should include only information that was available at the time the plan or protocol for the study was written; all information obtained during the conduct of the study belongs in the Results section. It should include information on:

- Selection and Description of Participants (patients or laboratory animals, including controls). Describe your selection of the observational or experimental participants (patients or laboratory animals, including controls) clearly, including eligibility and exclusion criteria and a description of variables such as age and sex.
- Identify the methods and procedures in sufficient detail to allow other workers to reproduce the results. Give references and brief descriptions for methods that have been published but are not well known; describe new or substantially modified methods, give reasons for using them, and evaluate their limitations. Identify precisely all drugs and chemicals used, including generic name(s), dose(s), and route(s) of administration.
- Describe statistical methods with enough detail to enable a knowledgeable reader with access to the original data to verify the reported results. When possible, quantify findings and present them with appropriate indicators of measurement error or uncertainty (such as confidence intervals). Avoid relying solely on statistical hypothesis testing, such as the use of p values, which fails to convey important information about effect size. Define statistical terms, abbreviations, and most symbols. Specify the computer software used.

RESULTS

Describe your results in words, with reference to tables or graphs or figures when necessary. Present your results in logical sequence, giving the main or most important findings first. Do not repeat in the text all the data in the tables or illustrations; emphasize or summarize only important observations. When data are summarized in the Result section, give numeric results not only as derivatives (e.g. percentages) but also as the absolute numbers from which the derivatives were calculated, and specify the statistical methods used to analyze them. Restrict tables and figures to those needed to explain the argument of the paper and to assess its support. Use graphs as an alternative to tables with many entries; do not duplicate data in graphs and tables.

DISCUSSION

Emphasize the new and important aspects of the study and the conclusions that follow from them. Do not repeat in detail data or any material given in the Introduction or the Results section. For experimental studies it is useful to begin the discussion by summarizing briefly the main findings, then explore possible mechanisms or explanations for these findings, compare and contrast the results with other relevant studies, state the limitations of the study, and explore the implications of the findings for future research and for clinical practice.

ACKNOWLEDGEMENTS

Acknowledgements, if any, should appear before References.

REFERENCES

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Serdaroglu E, Mir S, Kabasakal C. (2002). Urine protein-osmalality ratio for quantification of proteinuria in children. Nephrol Dialysis Transpl 17: S114 (suppl 1).

Matos V, Drukker A, Guignard JP. (1999). Spot urine samples for evaluating solute excretion in the first week of life. Arch Dis Fetal Neonatal Ed 80: F240 – 2.

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Should be provided only if they improve the article. For X-ray films, scans, and other diagnostic images, as well as pictures of pathology specimens or photomicrographs, send sharp, glossy, black-and-white or colour photographic prints, usually 127 .90 mm. On back of each figure, list the figure number, name of the first author, title of the article, and an arrow indicating the right orientation of the figure. Colour photographs, if found to improve the article, would be published at no extra charge. Letters, numbers, and symbols on Figures should therefore be clear and even throughout, and of sufficient size that when reduced for publication each item will still be legible. Figures should be made as self-explanatory as possible. Type or print out legends for illustrations on a separate page, with Arabic numerals corresponding to the illustrations. When symbols, arrows, numbers, or letters are used to identify parts of the illustrations, identify and explain each one clearly in the legend. Explain the internal scale and identify the method of staining in photomicrographs. Markers should be clear with high-contrast with appropriate explanation in the corresponding legend. Be sure that each figure is cited in the text.

Abbreviations and Symbols

Use only standard abbreviations; the use of non-standard abbreviations can be extremely confusing to readers. Avoid abbreviations in the title. The full term for which an abbreviation stands should precede its first use in the text unless it is a standard unit of measurement.

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