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LMIC Facility-Lighting Limitation in Nigeria Fully Resolved by a Novel Frugal Polite-Light-Bank Technology

By Hippolite O Amadi & Amina L Abubakar

Kaduna State University

Abstract- Epileptic grid electricity and frequent power blackouts in the night at LMIC neonatal centres hide behind frontline morbidities but contribute significantly to poor treatment outcomes at these centres. Power blackouts make it hard for clinicians and nurses to see clearly when attending to patients in the dark. Hence, many patients have lost their lives during the mistake-prone poor visual setting. This situation gets worse for centres located at more remote regions of LMICs, where power outages could last for many days. A recently published article on "neonatal-rescue-scheme" concept proposed the reversal in neonatal traffic, by taking the interventions to rural places where more needy neonates are to save them. Therefore, it becomes imperative to develop a reliable solar system of independent and sustainable technology that can guarantee dusk-to-dawn facility lighting at such remote locations, which may not have grid electricity.

Keywords: *LMIC neonates, facility lighting, power blackout, neonatal mortality.*

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LMIC Facility-Lighting Limitation in Nigeria Fully Resolved by a Novel Frugal Polite-Light-Bank Technology

Hippolite O Amadi [α] & Amina L Abubakar [σ]

Abstract- Epileptic grid electricity and frequent power blackouts in the night at LMIC neonatal centres hide behind frontline morbidities but contribute significantly to poor treatment outcomes at these centres. Power blackouts make it hard for clinicians and nurses to see clearly when attending to patients in the dark. Hence, many patients have lost their lives during the mistake-prone poor visual setting. This situation gets worse for centres located at more remote regions of LMICs, where power outages could last for many days. A recently published article on "neonatal-rescue-scheme" concept proposed the reversal in neonatal traffic, by taking the interventions to rural places where more needy neonates are to save them. Therefore, it becomes imperative to develop a reliable solar system of independent and sustainable technology that can guarantee dusk-to-dawn facility lighting at such remote locations, which may not have grid electricity.

This was achieved by technology morphing of existing market products, recreating these to fit the LMICs' peculiar environmental and cultural settings. The resulting construct, polite-light-bank (PLB), passed all rigorous testing of structural integrity under the weather and functionality stability under strenuous usage. For over a period of four years, the new construct provided over 95% reliability and nearly 100% satisfaction ratings from the initial five centres that used it and have continued to use this to date. This is a golden piece of work that any LMIC or similar settings must not ignore.

Keywords: LMIC neonates, facility lighting, power blackout, neonatal mortality.

I. Introduction

Incessant sudden power failures at Nigerian and other LMIC healthcare facilities, especially the special care baby units (SCBU) of the tertiary hospitals, are endemic and this has been associated with high mortality rates in the countries[1 – 4]. The failures lead to abrupt cessation of the operation of all life-support devices from which many patients had died. However, this contributor to the causes of death is not usually reported in the associated end-of-life file documents. This kind of situation where technology failure becomes a significant contributor to the cause-of-death has been described as a powerful mortality factor that are hardly reported in a deceased-patient's file in Nigeria, but dwells only in the minds of practicing doctors and nurses who continually witness this[5]. Apart from the immediate impact on patients who are directly under machine support, there are many other patients and carers who could have been injured, especially at night owing to the sudden unexpected darkness that engulfs the environment. This includes accidents such as patients being given the wrong medication, duty staff bumping into each other and hitting themselves against harmful stationary items around the SCBU and the walkways, costly errors on patients whilst neonatal line-setting procedure is being performed, etc. Total facility light blackouts, though common in Nigeria, has such a demoralising effect on the clinical and nursing team as they struggle to carry on with makeshift handheld mobile lamps such as mobile-phone torchlight. There may not be any empirical quantification of Nigeria's annual death rate associated with poor facility lighting; however, this might present a terrifying figure if computed.

Observably, staff on duty tend to exhibit some levels of reluctance whenever the clinical need arises to stay longer at work during such night periods with blackouts. Many publications have emphasised the need for Nigeria's power sector to improve its power supply reliability, but this has not yielded any result [1, 2, 6]. Therefore, there is an urgent need to create a suitable alternative for a reliable lighting technology for tertiary hospital neonatal centres other than the present quality of grid electricity in Nigeria and other similar LMICs. This worrisome lighting situation is happening at centres in big LMICs cities; hence, the more precarious situations at rural towns can only be dreadfully imagined. This clearly explains one of the fundamental reasons why many rural hospitals are characteristically unable to provide adequate survival support to prevent the deaths of nearby neonates. The recent proposal and demonstration of the neonatal-rescue-scheme (NRS) of Amadi et al. (2022), which revolves around the concept of reversing the neonatal traffic, by "taking our medicine to the needy neonates where they are", will be impossible to achieve at LMICs without decisive independent and locally sustainable lighting solution [7]. Such a system should be low-cost to install, have

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reliable frugal technology, and with minimal maintenance requirements. In this article, we describe the materials selection, trialling, and four years usage outcome of an LMICs-facility lighting solution–the Polite Light Bank (PLB) system, an aspect of the NRS technologies– currently in use at five neonatal facilities in Nigeria.

II. Materials and Methods

The set objectives of the project were defined to include but are not limited to: (a) to make the new system an independent installation from any existing powerbank backup system that supplies the sockets for powering the incubators and other essential equipment in the Unit. (b) the system should be operated on low dc power with artificial intelligence to know when there is sufficient daylight or conventional electric power to enable its automatic switching (ON/OFF) as necessary. (c) the system's total power storage should be sufficient to support all light-points throughout the dark periods of the night and cloudy day. (c) the system should sufficiently rely on solar panels for the recharging of its batteries so that it could be reliable as the only source of lighting a facility in a typical remote village of Nigeria without grid electricity.(d) the light-points should be as maintenance free as possible with high reliability and great illumination intensity. (e) the illumination intensity of each light-point should be powerful enough to enable a staff team to carry out neonatal 'line-setting' procedure at night-time without the need for extra lighting support. (f) the battery storage requirement should be easily sourced locally within the nearest urban town market to avoid prolonged downtime when a replacement is needed.

A concept was designed in which four constituent assemblies of the proposed system were identified (Figure 1). A choice of creating outright fresh designs of these assemblies to the highest standards as required could take many years to accomplish, too sophisticated, too expensive, and may not yield the desired accuracy and quality. Therefore, the commercial products morphing and grouping technique, as described previously in the literature, was adopted to create each assembly as close as possible to desired high standards [8].

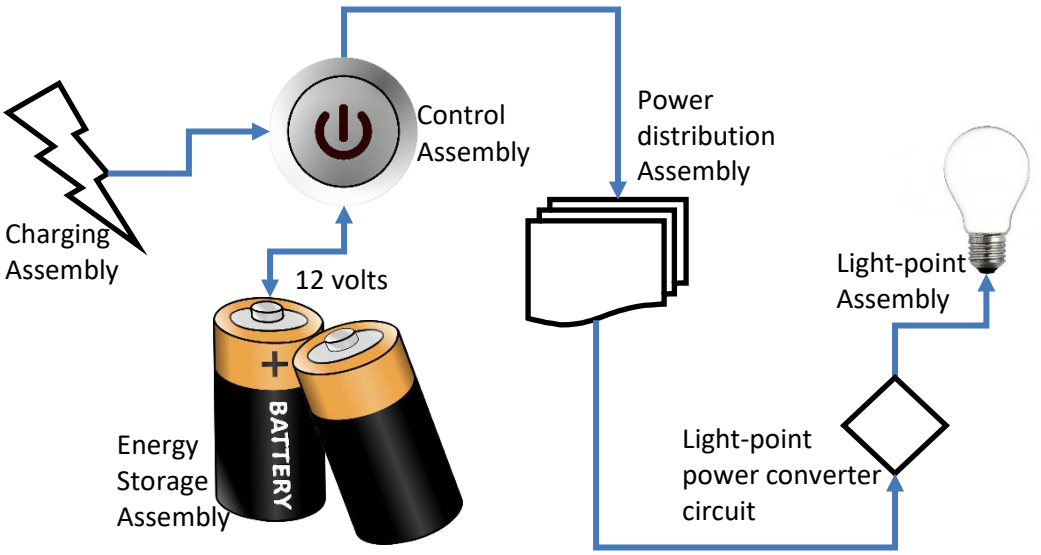

Figure 1: The five constituent assembles of the proposed system

Material selection for building the Charging Assembly was based on tested reliability of locally available (within the Nigerian upstream market) solar panels with ratings of 12 volts, 170 watts photo-voltaic cells, all assembled in parallel with the aim of delivering up to 12 volts, 15 amperes of charging current to the control assembly during the peak of sunlight intensity. The capacity of the energy Storage Assembly was determined by the total number of the light-points to be installed as adjusted by any possible voltage drops along the distribution line assembly. The storage capacity, in turn, is applied to determine the number of required panels of the Charging Assembly to guarantee 4 hours of total battery charging time during sunshine. The storage was built using locally available auto dry cell batteries of rating 12 volts, 150 amp-hours, arranged in parallel to achieve the required capacity. The Control Assembly integrates a current-tracking MPPT-technology charge regulator, which ensures a long-lasting protection of the energy storage cells. The Control Assembly retrieves input of 12 volts DC from storage and delivers the same 12 voltage for distribution; hence, it runs without an intermediary inverter. The Control Assembly is also equipped with photo-sensitive switching modules to power down the output supply during daylight or when other bright light

sources shine around it. This addition enhanced the system's automatic switching capability. The 12 volts DC Distribution Assembly used a parallel cabling technique applying 2.5 mm pure copper cables to supply each light-point. The light-point was designed by obtaining four different types of regularly available >100 LED chips assembles, with a minimum intensity rating of 1000 lumens. These were experimentally tested for efficiency, durability, and weathering by exteriorly mounting and continuously powering these in a typical Nigerian village under rain and sunshine for eight months. The best of the light-point products was chosen and re-morphed to operate via the designed distribution assembly of the polite-light-bank. The initial steps of the morphing technique involved the disassembling of the commercial light-point to study its circuitry, carrying out tests, and taking note of its absolute powering voltage and power consumption rate. The outcomes were later applied in the design of a new power-converter circuit for the re-morphed light-point. Hence, the re-morphing was carried out in two steps – powering circuit re-engineering and structural encasement re-engineering. These were carefully executed to ensure minimal alteration of its original aesthetic values. The final product was replicated for powering a PLB system capacity of 19 light-points at the neonatal section of General Hospital Minna, Nigeria (the Amina-centre) in 2019, distributed across with a total two-core cabling length of about 560 metres. A few other centres later heard about the PLB at Minna. They decided to install the PLB as well, including the Federal Medical Centre Owerri with 24 light-points and the Neoroom-section at Calabar Women and Children Hospital (CWCH) with 10 light-points [9, 10]. Final qualitative assessments were independently presented by one major referral centre in northern Nigeria and one Neoroom (miniaturised neonatal centre) in southern Nigeria as these were the only centres that demonstrated their prospective log notes to qualify for assessment submission (Figure 2). Each hospital carried out their assessment via a questionnaire and led by the Ward-manager of the Centres – Matron M Usman and Mr G Adim, respectively.

Figure 2: Neoroom at CWCH Calabar at night-time

III. Results/discussion

System performance assessment at two centres (Amina-centre Minna and CWCH Calabar) was prospectively carried out by capturing the inclusive periods of PLB switch-on and switch-off for 44 and five months, respectively, until the end of March 2023 (Table 1). Illumination performance and practice impacts were qualitatively assessed against the benchmark of ease of carrying out neonatal line-setting procedures without requiring additional or brighter light as duty demanded. The CWCH Neoroom, in their qualitative report, declared that the use of their new PLB-technology currently saves 60% of their usual operational costs per neonate. This being the proportion of the treatment charge per neonate, which went into fusil fuel and maintenance costs of the power-generator whenever a neonate was on admission. This amount is saved in addition to the elimination of long hours of noise and air pollution of the environment by the power generator, the report continued: "therefore, the staff of this Neoroom are conscious of our high score ratings for our PLB because the system is just as we have assessed it based on our five months' usage experience".

Table 1: Qualitative assessment records from two Nigerian neonatal centres

S/N	Criteria (Score: 0% – 100%)		Details of criteria and Scoring benchmarks	The Amina-centre, General Hospital Minna	The Neoroom, Calabar Women and Children Hospital
1	Usage till date		How long has the centre been using the PLB till date?	3 years and 8 months	5 months
2	Lighting coverage	The walkways	By how much satisfaction does the PLB illumination sufficiently cover walking around safely without need of extra lighting? No illumination (0%) – extremely sufficient (100%)	100	100
		Inner wards/SCBU		100	100
3	By what amount has anxiety over lighting failure dropped?		You know how worried you can get as the ward manager when you have a patient, but there is a grid power failure and no fuel to run the generator. The PLB must have removed some of the worries you normally faced in such situations, such as possible accidents whilst walking around or patient care mistakes whilst working in the dark. By how much has the PLB relieved you of this worry? [still as anxious as ever (0%) – completely relieved of this anxiety (100%)]	100	100
4	Light-point intensity for work		What is the satisfaction rate for PLB light-point intensity for carrying out high precision procedures such as neonatal line-setting?	90	100
5	All night lighting coverage		During all night blackout, what percentage of the night (dusk-to-dawn) does your PLB retain its full illumination?[Goes off <1 hr after (0%) – lasts till daybreak without failure (100%)]	100	100
6	System automatic control		The PLB is completely self-operating. What is your satisfaction rate for the efficiency of this automation?[Manual support needed always (0%) – never ever had cause for manual control(100%)]	100	100
7	System reliability		What is your fair score on the reliability of the PLB?	100	100
8	Light-point failures since installation		Based on the total light-points of your PLB, how many of these have ever failed to come on as at when expected since installation?	1 out of 19. This happened after 3 years of usage	none out of 10
9	Overall satisfaction		What is your overall satisfaction of your night lighting problem as solved by the PLB till date?	99	97
10	Comments and Concerns		**CWCH:** (a) wished for PLB extended to cover the laboratory section and save further power cost (b) wished for light-points installed in two other important rooms of the Unit. **Amina-centre:** wished for PLB light-points installed in additional four rooms at the Centre.		

The strategy of developing a low-cost rural healthcare lighting system for keeping neonatal facility illuminated during the night with high intensity light-points was set to achieve some primary objectives, which initially seemed impossible. This challenge emanated from the pressure experienced at the neonatal intensive care section of the Minna General Hospital Nigeria (the Amina-centre), where we discovered that the installed 2400 AH storage capacity inverter-controlled power-bank was being drained in quick time by the conventional 220 volts, 9 watts light bulbs that were linked to this. The essential life-support gadgets such as the incubators would hence poweroff in quick time because of the 'battery-low' inverter warning and switch off. The power off often happened some midway into the night during prolonged night blackouts. However, the battery energy could last up to three times longer than this whenever the 220 volts light bulbs were disconnected. Hence, it became necessary to seek to develop an independent system for lighting the facility only – and free from supplying power to the sockets, such that this could supply maximum illumination for all night long around and within the neonatal facility.

The implementation of our design followed the outcome of our selections based on reliability and the testing of existing commercial products, which were later re-morphed to achieve the hybrid construct of

polite-light-bank. The developed system was affordable with ease of installation at the centres and has been assessed with a very high success rating in its four years of operation. The overall system satisfaction score was >95% from the two centres, where the PLB was reported to have created a sharp night contrast during blackouts, between the neonatal centre and the rest of the hospital complex, respectively. The consistency of the PLB operations in the last four years at the Amina-centre is noticeable, with nostalgic appreciation that a certain section of the Minna General Hospital complex would always remain aglow all night long even during power blackouts that may last for many days. The PLB at the Amina-centre was a technology beyond expectation in terms of reliability and longevity as perceived at Minna General Hospital setting; hence, earning this facility the nickname of "the centre that never sleeps". The PLB is a breakthrough in the sourcing and development of relevant technologies for taking neonatal care into the hinterlands where the significant volume of the needy neonate dwell [7]. The high success rate, as reported from the hospitals, demonstrates that the PLB-technology could be a conclusive answer to the question of facility lighting for actualising the neonatal-rescue-scheme concept of Amadi et al. 2022 as proposed in the literature[7].

IV. Recommendations

We wish to, with no hesitation, request the LMICs governments, supervisory authorities and individual philanthropist organisations who wish to positively reverse the trends of neonatal indices to urgently deploy this aspect of the NRS concept and save these precious lives.

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Conflicts of Interest

We do not have any conflicts of interest to declare.

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Dance for Health during the Pandemic! Scientific Explanation of the Spining Rules for Dancing Couples, Which Make Them Healthier by Increasing and Balancing their Energy

By Prof. Maria Kuman, PhD
Holistic Research Institute

Abstract- The dancing rules for couples are: leading is the male partner, who start dancing with the left leg and leads in clockwise direction. Why? Nonlinear physics teaches that vortices spin clockwise and suck energy. If so, the spinning clockwise dancing man will suck energy and gain energy from the dance spinning, especially in fast spinning waltz. The energy gained from the clockwise-spinning dance will be added to the energy from the clockwise spinning of man's aura. The total gained energy will be shared with the dancing partner. My long-term studies found that the aura is nonlinear electromagnetic field NEMF. If so, aura energy gain can happen only if there is a reservoir of NEMF energy, from which the man can suck NEMF energy in.

Keywords: nonlinear physics; vortex spinning of male aura; vortex spinning of male dancing partner; anti-vortex spinning of female aura; anti-vortex spinning of female partner; energy uplift of both dancing partners; positive dancing effect on health.

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Keywords: nonlinear physics; vortex spinning of male aura; vortex spinning of male dancing partner; anti-vortex spinning of female aura; anti-vortex spinning of female partner; energy uplift of both dancing partners; positive dancing effect on health.

I. Introduction – What is Nonlinear Physics?

What is nonlinear physics? When the bottom of a river is smooth, the water movement is linear and linear physics describes it. If there is a big stone on the bottom of the river, the water needs to go around it, which makes the movement nonlinear and nonlinear movement requires nonlinear physics to describe it. Behind the stone, the water forms two spinning circles– one spinning clockwise (called vortex) and another spinning counterclockwise (called anti-vortex). Nonlinear Physics teaches that the spinning-clockwise vortices suck energy, while the spinning-counterclockwise anti-vortices emit energy. It is so because of the rule of the folded fingers of the right hand in physics - when the folded fingers show the direction of the electric current or spinning, the vertical thumb shows the direction of the induced magnetic field or the energy flow.

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II. My Studies of the Aura and my knowledge of Nonlinear Physics lead me to Understanding the Dancing Rules of Spinning Couples

Everyone of us is a material body and a weak light field surrounding the body called aura ("aura" means "light"). I studied the weak aura for more than 30 years. I started photographing the aura with Kirlian photography, which uses high frequency electric field to multiply the photons of the weak aura and make it photographable. I found that the aura is brighter at positive emotions and dimmer at negative emotions, i.e. I found that the aura is emotionally sensitive. How weak is the aura? The aura field is 1,000 times weaker than the electromagnetic field created by the biocurrents of the material body. However, I found that the weak field of the aura rules and regulates everything in the body – not with its strength, but with the information it carries. Since nonlinear fields do not dissipate and can imprint information, I decided that aura's field must be nonlinear electromagnetic field (NEMF). Then I developed and patented very sensitive equipment, which would allow me to measure the weak nonlinear field of the aura and to measure its vortices and anti-vortices (Fig. 1)[1].

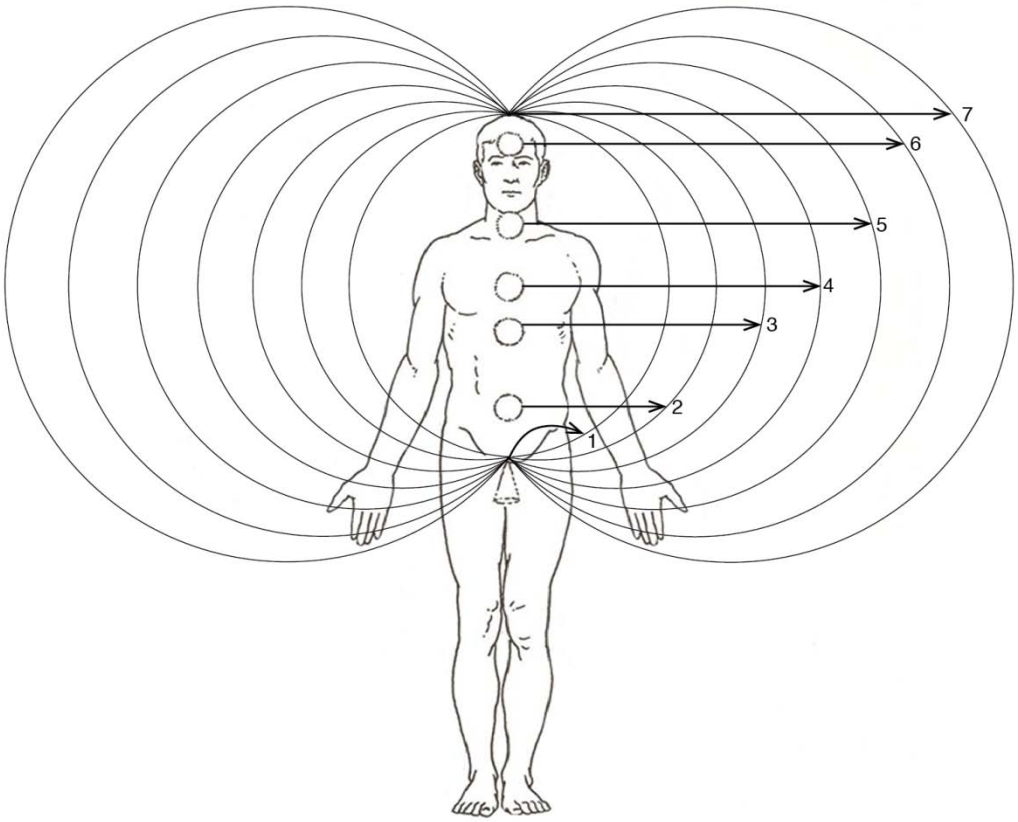

Fig. 1: The 7 aura energy levels of man's body and the numbered along the backbone alternating vortices and anti-vortices of the aura NEMF (called chakras)

By measuring the chain of alternating vortices and anti-vortices of the aura NEMF, which are along the backbone (called in ancient Hindu texts "chakras", which means "spinning wheels" in Sanskrit), I found that they spin in opposite directions in males and females at the same time of day or night.

III. Why the Dancing Rules Require Clockwise Spinning of the Leading Men

When a dancing couple is spinning in waltz, the man is on the left side and spins clockwise. Nonlinear physics teaches that vortices spin clockwise and suck energy. If so, the clockwise spinning man during dance is expected to suck energy through the top of his head and gain energy from the dance spinning. The energy gained from the clockwise spinning of the dance will be added to the energy sucked by the spinning clockwise man's aura. The Russian scientist Shkatov found with his patented equipment (allowing him to measure the spinning of the aura) that positive emotions make man's aura to spin faster clockwise like a vortex and suck energy [2]. If so, the energy uplift from clockwise spinning dance is supposed to be as the energy uplift experienced at positive emotions. When a dancing couple is spinning in waltz, the energy gained by man's clockwise spinning, is shared with his dancing partner. Therefore, the rules of dancing spinning are such that they bring energy uplift to both dancing partners – males and females.

IV. My Studies of the Role of Positive Emotions and Positive Thinking on our Health

Shkatov found that at positive emotions men's aura spins clockwise and at negative emotions men's aura spins counterclockwise [2]. Measurements with my patented supersensitive energy meter allowed me to see the effect of positive emotions and even positive thinking on our energy balance, which determines our health. I found that positive emotions (or just positive thinking) increase the body energy and make it more balanced. Since perfect balance means perfect health positive emotions or just positive thinking improve our health (Fig 2).

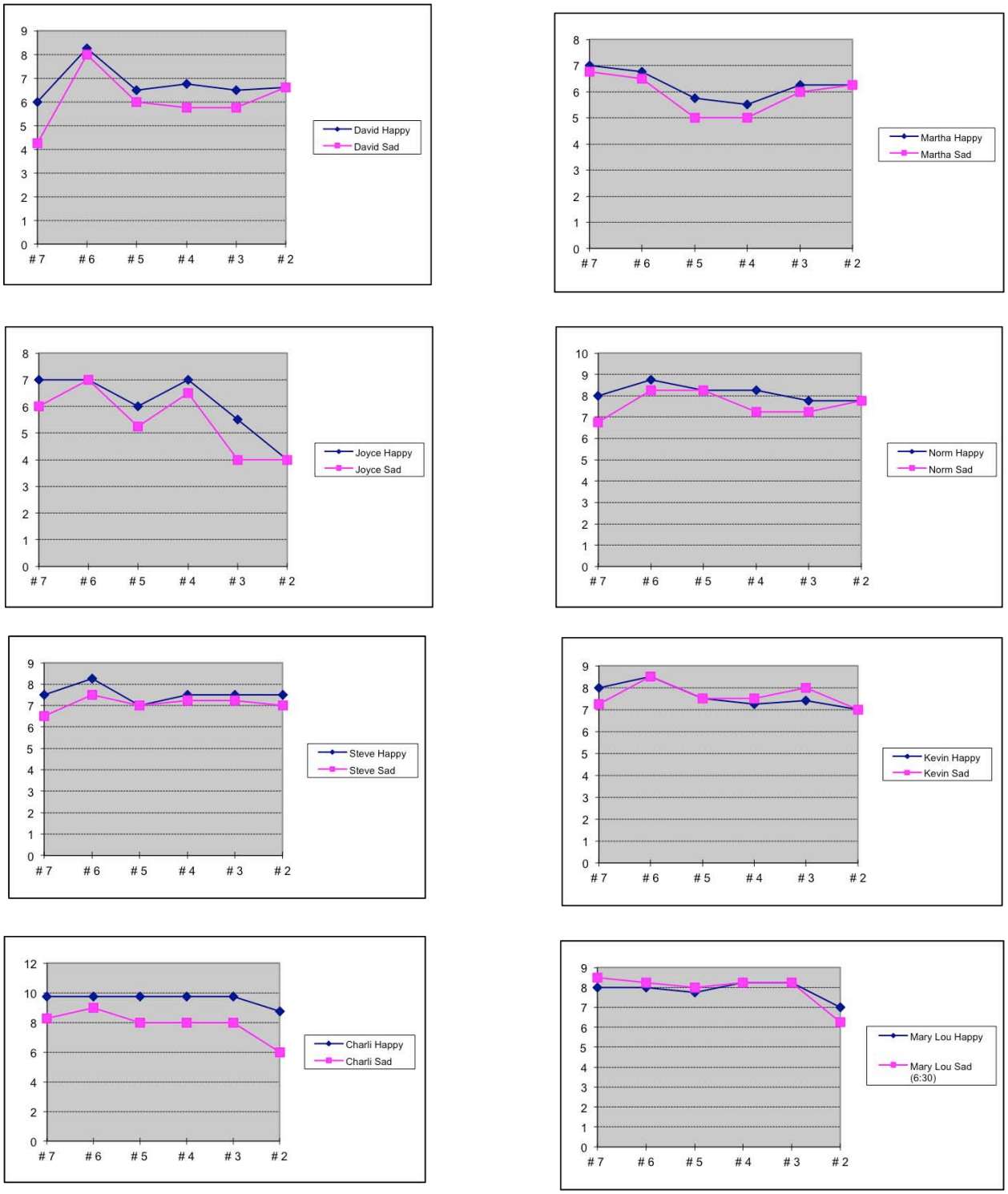

Fig. 2: The measured positive effect (higher energy and better balance) of positive thinking on our health

Since clockwise spinning of dancing partners has the same uplifting effect on both dancing partners as the effect of positive emotions (or just positive thinking), we can expect dancing with clockwise spinning to have the same positive effect on the health of the dancing partners as positive emotions (or just positive thinking).

V. My Studies of the Aura Led me to Understanding the Nature of the Space Matrix NEMF

Thus, men's aura spins clockwise during the day and sucks energy through the vortex on top of their heads to get energized for the daily activities (Fig. 1).

Positive emotions make the aura spin faster and suck more energy. When the man spins clockwise in a dance (waltz), he sucks more energy through the vortex on top of his head. For all this to happen, there must be reservoir of energy, from which the clockwise spinning auras of men suck energy. Our science chose to believe that there is no ether – it is vacuum, regardless that Michelson later came up with idea for experiment with higher accuracy, with which Syniak in 1911 and Michelson in 1925 proved that ether does exist [3]. Our science chose to ignore these experiments and continued to claim that ether does not exist – it is vacuum. However, it cannot be vacuum because our auras (and the Sun) are plasma and they generate energy as they spin. Plasma spinning in vacuum cannot generate energy, while plasma spinning in ether, which is nonlinear electromagnetic field (NEMF), can. This proves that the media (called ether) is NEMF, not vacuum. But let come to this step by step.

If the auras are NEMF, and at positive emotions men's auras become brighter, there must be reservoir of NEMF energy, from which men's auras suck NEMF energy. Since nonlinear fields do not dissipate and can imprint information, I decided that the primary Space Matrix from which the Universe was created must have been NEMF. (The Creator first created a sphere of this not dissipating NEMF (Space Matrix). Then He imprinted on it the three-dimensional holographic image of the Universe to be, and the Universe was created [4]).Positive emotions (as well as the clockwise spinning dancing men) make men's clockwise-spinning auras to spin faster and suck more energy from the Space Matrix NEMF through the vortex on the top of their heads, from which the concept of Father God in Heaven, originated. (The concept of Mother Goddess of Earth originated from the fact that women's auras spin counterclockwise and suck energy from the Earth NEMF through the vortex at their tailbone. In my article [5], I explained that since the auras in men and women spin in opposite direction, the attraction between the sexes is magnetic in origin).

VI. My Studies of the Aura Led me to the Conclusion that the Aura is our Emotional Spirit

Since positive emotions make the aura brighter and we say we are in high Spirit when we experience positive emotions, I concluded that the aura must be our Spirit. Then I found that the ancient Jewish Cabala was teaching to high priests that the aura is our Spirit. Thus, after many years of work I discovered what the ancients knew thousands of years ago - that the aura is our Spirit. (This re-discovery should not be surprising because the cycle of solar activity rules the development of civilizations on Earth. When the Sun is active, the increased magnetic field of the Sun stimulates the brains of man, and they develop advanced civilizations. When the solar activity drops down to zero, the civilizations of man on Earth drop down to zero – people even forget how to write. At the next solar activity, the man on earth start developing civilization from zero. This makes each civilization different, i.e. with its own color, which makes it interesting to observe - it is not a borrowing repetition of the same. And the most important -the imposed through the solar cycle limit of solar activity put an upper limit to our development. In this way, the Creator God (who made us creative as himself) felt secure that we would never reach His level of development and be a tread for our Creator Hu (Human means Man created by the Creator God Hu).

VII. The Spinning of Dervish Men and Single Women

The so-called Dervish Men spin clockwise and they claim that if they spin long enough the energy of their aura (Spirit) will increase so much that they will shift to a higher Spiritual Level. Since vortices spin clockwise and suck energy, the Dervish men with spinning clockwise aura by spinning clockwise would indeed gain energy.

1/ There are no Dervish women, but if women should do this, they need to spin counterclockwise because their auras spin counterclockwise and suck energy from the Earth NEMF through their tailbones.

2/ When men and women dance circle dances, their movement should always be clockwise because only at vortex-like clockwise movement energy is sucked from the Space Matrix NEMF and this energy gain would be shared between the dance partners.

VIII. Conclusion

The article explained that the dancing rules for couples require clockwise spinning of the male partners because men's aura spins clockwise, and only clockwise dance spinning can farther increase the clockwise spinning of their auras and boost their energy. The energy gain is shared between the two partners. Since positive emotions make men's auras spin faster clockwise, the boost of energy for dancers spinning clockwise is the same as their boost of energy at positive emotions (or just positive thinking). Based on my measurements of the effect of positive emotions (or just positive thinking), I claim that not only will the clockwise waltz dancing increase the energy of both dancers, their energy will become more balanced, which will make the dancers healthier. Thus, dance for energy gain and dance for energy balance, which is health!

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Technical Electrosmog May be Dangerous

By Doepp, Manfred

Abstract- It is scientifically controversial so far whether EMF (non-ionizing electromagnetic fields) can have negative effects on the DNA of cell nuclei. In terms of their energy, they could not do so. However, there is clinical and molecular biological evidence that this can be. There exists a 3-stage mechanism of action, via peroxinitrite, which could lead to DNA damage. The sequence of these processes will be described. Therefore, there is a reasonable suspicion that EMF could also cause DNA damage. The organs with fast and high cell division rate are particularly affected. The general exposure to technical electrosmog (especially 5G) must therefore be marked with a question mark.

Keywords: *technical electromog, electro-magnetic fields - EMF, DNA damages, 5G.*

GJMR-K Classification: *LCC: RA 1231.E42*

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I. Introduction

It is an accepted fact that ionizing radiation such as X-rays and gamma radiation is harmful to the body and significantly increases the risk of cancer.(1) This is explained by the fact that the wavelength of ionizing radiation is short and the energies and frequencies are high. Their energy is strong enough to directly break the electron pair bonds that hold DNA together.

However, contrary to popular belief, most of the damage occurs not because the ionizing radiation directly breaks the electron pair bonds of DNA, but because the radiation interacts with the cell water and, in particular, the cell nucleus. When the ionizing radiation hits the water in your cell nucleus, it forms dangerous hydroxyl radicals.(2) These cannot travel long distances. But because the radiation causes these free radicals to form in the cell nucleus right next to the nuclear DNA, they can cause damage to the DNA. This is called indirect ionization, and it is responsible for much of the damage that ionizing radiation does to DNA.

II. Also Non-ionizing Radiation Damages the DNA

While it is true that non-ionizing radiation, such as that emitted by cell phones, transmitters and WLAN, is of a lower frequency than ionizing radiation and does not have sufficient energy to create hydroxyl radicals, it is not true that non-ionizing radiation cannot damage DNA. It can, in fact, by producing peroxinitrite and, in the next step, carbonate radicals.(3) As it turns out, peroxinitrite production was the missing piece of the puzzle that explains why non-ionizing radiation can be just as damaging as ionizing radiation.

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III. Some Evidence

In 2008, researcher Franz Adlkofer (Franz Xaver Adlkofer (* 14. December 1935 at Attenzell/Germany; † 18. June 2022 at Paros/ Greece (4)) worked for a study using a comet assay, a highly sensitive test for DNA damage. The comet assay (also called single cell gel electrophoresis) is a technique of gel electrophoresis by which it is possible to detect DNA damage in single cells.(5) The assay was developed in 1984 by Östling and Johanson to detect DNA double-strand breaks.(6) With further development by Singh in 1988, DNA single-strand breaks could also be detected by using basic buffers. The principle of the Comet assay is based on lysing cells embedded in agarose and exposing them to an electric field, known as electrophoresis. During electrophoresis, the negatively charged DNA migrates to the positive pole and, thanks to the pores in the agarose, the fragments separate according to size, as the smaller fragments travel a further distance in a given time than the larger ones. Chromosomal DNA, however, is too large to travel as a whole in the electric field. Only damaged, fragmentary DNA is able to migrate out of the cell nucleus here. Under the UV microscope, the damaged cells, which were previously stained with fluorescent dyes such as ethidium bromide, now appear with a tail of DNA fragments that gives them the appearance of a comet. In the comet assay, all cells that have a nucleus can be used.

He found that very weak EMF exposure at 1.8 GHz produced DNA breaks in large quantities. From 2000 to 2004, Adlkofer led the REFLEX project, which resulted in the REFLEX study, an EU-funded investigation of the impact of cell phone radiation on human organisms conducted by the Foundation for Behavior and the Environment.(7,8)

IV. Peroxinitrite

We now know why EMF radiation can lead to exceptionally high peroxinitrite concentrations. The hydroxyl radical (OH radical, HO-) is a molecule composed of one hydrogen and one oxygen atom. As a radical, it has a single, unpaired electron and is therefore very reactive. The process occurs in three steps, and each leads to massive amplification. With three amplifying steps in succession, a very small output signal can lead to a large response: If the cells' voltage-gated calcium channels are open, they allow about a million calcium ions per second to flow into the cell.(9) The higher calcium concentration in the cells activates

the synthesis of nitric oxide and superoxide. Peroxinitrite forms in proportion to the result of nitric oxide concentration times superoxide concentration.

V. Especially Affected: Organs with a High Cell Division Rate

Among the most vulnerable tissues are the brain, heart, and reproductive organs - the very tissues that are most affected when we are exposed to EMF. This is probably why neuropsychiatric diseases and neurodegenerative diseases such as Alzheimer's have exploded over the past 2 decades, at the same time that fertility rates have declined. It is thus an illusion that EMF is not harmful. We are putting our future at risk with EMF, especially 5G – maybe in parallel with mRNA vaccination.(10)

VI. Conclusion

The question whether EMF are harmless can be answered in the negative with high probability. There are intranuclear processes that can cause a change in the DNA even at low energy of the EMF. The mechanisms were described by Adlkofer (4) and proven by scientifically accepted methods. It would be indicated to follow up and verify his experiments with a larger study.

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Association between Systemic Lupus Erythematosus and Refractory Ulcerative Colitis: What are our Therapeutic Options?

By Chait Yassine, Nacir Oussama, Ait Errami Adil, Samlani Zouhour, Krati Khadija & Oubaha Sofia

Mohammed VI University

Abstract- Systemic lupus erythematosus (SLE)is an autoimmune disease in which the immune system through antibodies attacks its own tissues, and causes inflammation and tissue damage in the affected organs. It can affect the skin, brain, lungs, kidneys, and blood vessels (1).

Ulcerative colitis is an inflammatory bowel disease (IBD) that causes inflammation and ulcers (sores) in your digestive tract. Ulcerative colitis affects the innermost lining of your large intestine, also called the colon, and rectum.

This article is about a patient followed for systemic lupus, presenting digest if symptoms reveling ulcerative colitis, the therapeutic challenge we faced is the potential aggravation of lupus symptoms under anti TNF therapy. The patient underwent curative surgery without major complication.

GJMR-K Classification: *NLMC Code: WI 360*

Strictly as per the compliance and regulations of:

Association between Systemic Lupus Erythematosus and Refractory Ulcerative Colitis: What are our Therapeutic Options?

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This article is about a patient followed for systemic lupus, presenting digest if symptoms reveling ulcerative colitis, the therapeutic challenge we faced is the potential aggravation of lupus symptoms under anti TNF therapy. The patient underwent curative surgery without major complication.

I. Introduction

Patient with systemic lupus erythematosus (SLE) may experience various intestinal disorders such as diarrhea, vomiting, rectal bleeding, tenesmus. However, even if it's not very common, it is important to think of inflammatory bowel diseases especially Crohn's disease as well as Ulcerative colitis. In fact, SLE and Ulcerative colitis (UC)rarely coexist. They may both have intestinal manifestations, laboratory results, and radiographic findings that appear similar, therefore differentiating between intestinal involvement in UC and in SLE may be difficult(1).

Moreover, there are issues establishing true links between UC and SLE because SLE may mimic UC, and some UC treatments may cause drug induced SLE(1).

This makes the diagnosis of both diseases in one patient a real challenge. There are, in fact, few reports suggesting an association between these diseases (1–6).

Current understanding of the pathogenesis of the UC and SLE suggests that immune mechanisms play a prominent role in both diseases. In both diseases, genetic seems also to play an important role. Genetic markers located in the short arm of chromosome 6 have been found associated with both SLE to a lesser degree with UC (7,8).

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It is well known that UC is a chronic condition for which therapy is required to induce and maintain remission; therapeutic decisions should be categorized into those for induction and maintenance, with a goal of obtaining and maintaining a steroid-free remission (9).

Ulcerative colitis can be treated by 5-aminosalicylate (5-ASA), steroids oranti tumor necrosis factor alpha (anti-TNF alpha). SLE is known to interfere with some of these treatments, moreover, it can be a complication of these treatments. All this poses a real problematic while managing some UC cases, especially those with resistant to the majority of medical treatments (9).

The aim of our case report is to present one of these problematic cases, to compare it with different experiences in other centers, to review the literature in order to find out therapeutic options for these cases, and why not be a base for ulterior guidelines.

II. Observation

At the age of 31, the patient was admitted with a seven month history official and finger erythema and arthralgia. Physical Examination revealed a typical malarrash *(Figure 1)* and discoid lesions on her fingers *(Figure 2)*. The antinuclear, -antibody (ANA) were positives (1/256), the antibodies to double-stranded (DNA) were positives, the serum complement was low (17.6Vlml:normal30-40). The patient was therefore diagnosed with SLE according to American Rheumatism Association criteria for SLE. The patient began treatment with 30 mg/day prednisolone (PSL) and chloroquine 400mg/day, PSL was subsequently reduced to 10 mg/day. The symptoms were controlled in the following 9 years under treatment.

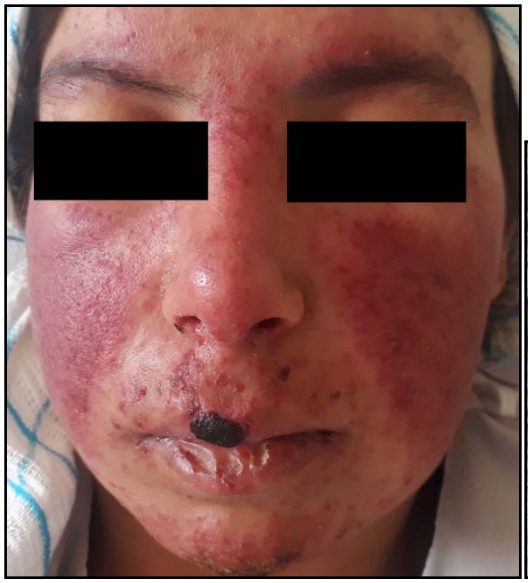


Figure 1: Facial malar rash

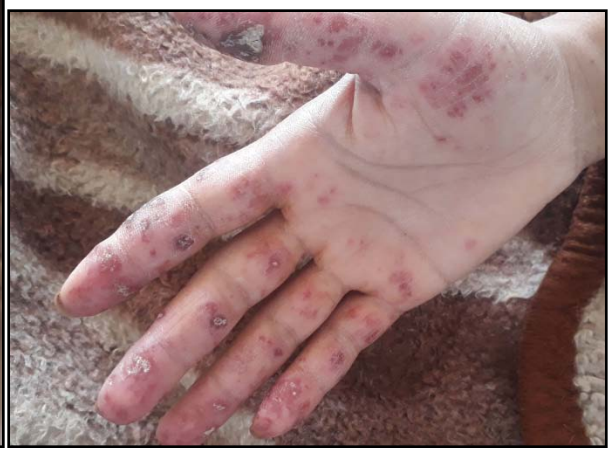
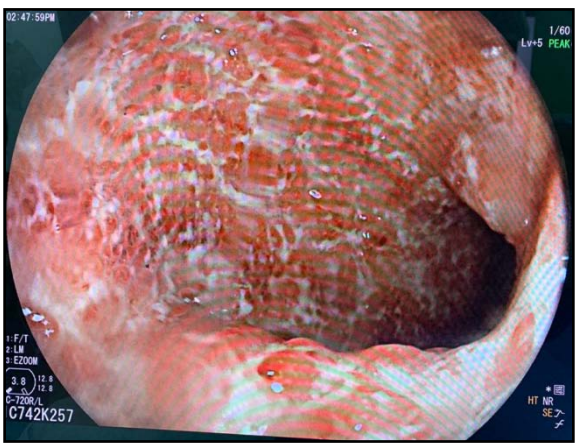


Figure 2: Finger discoid lesions

Bloody diarrhea accompanied with abdominal cramping and rectal bleeding with tenesmus began to occur intermittently when the patient was 40 year old. Intestinal involvement in lupus was first suspected, colonoscopy revealed continuous areas of inflammation and ulcers in the descending colon and in the transverse *(figure 3,4,5,6)*. Stool studies were negative for infection, histological evaluation revealed acute inflammation with crypt architectural distortion diffusely consistent with inflammatory bowel disease, favoring UC.



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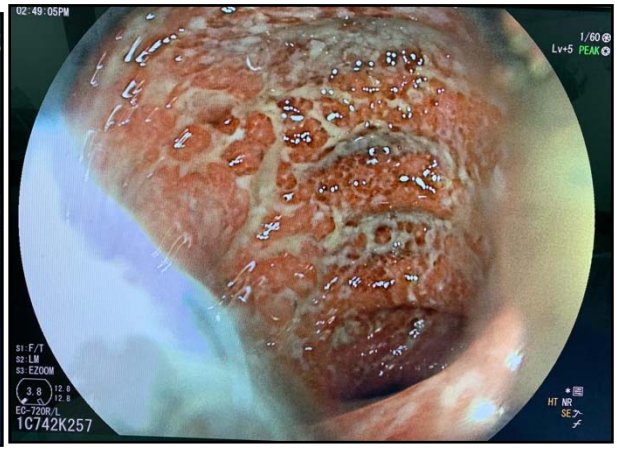

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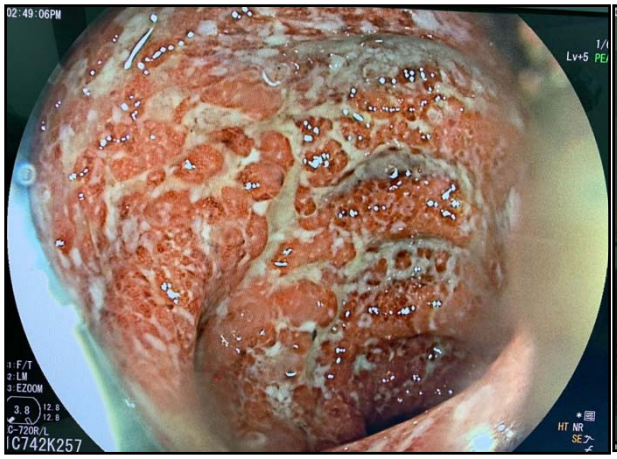

Figure 5

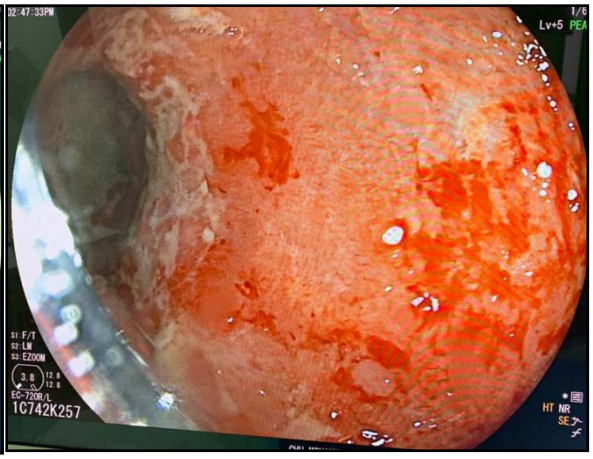

Figure 6

Figure 1-6: endoscopic aspect of ulcerative colitis attack

The diagnostic of UC was made and treatment with PSL 50mg daily, azathioprine 125 mg/day, chloroquine 200 mg/day was begun. This was followed by significant improvement. Two months later, remission was maintained with azathioprine, PSL 10 mg/day and chloroquine.

The patient was admitted again 6 months later, she developed bloody diarrhea with abdominal pain, and tenesumus, colonoscopy revealed inflamed hyperemic colonic mucosa with multiple active ulcers, Hemoglobin (Hb) was 9.1 g/dl (normocytic), white blood cell count was 12.44 × 103/ml (neutrophilic leukocytes: 90.8%, lymphocytes: 7.4%), and platelets were 3 × 105 /µl, C-reactive protein(CRP) and erythrocyte sedimentation rate were 78 mg/dl and 35 mm/h respectively. The patient was therefore treated with intravenous corticosteroids (1mg/kg/day) for 7 days then with PSL 50 mg/day, and azathioprine was switched to 6 mercaptopurine (6MP) 75mg/day, this was followed by clinical and biological improvement.

The patient developed 3 weeks later, anemia (Hb: 7.5 g/dl) and leucopenia (white blood cell count was 2341/ml), this was related to 6MP hematotoxicity. 6 mercaptopurine (6MP) was stopped and anemia as well as leucopenia improved. The patient was then treated with methotrexate (MTX) to maintain remission. Remission was maintained for the following year under MTX.

A year and two months later, the patient was admitted for an UC attack, she was having Bloody diarrhea as well as severe tenesmus and rectal bleeding, colonoscopy revealed inflamedfriable mucosa severely hemorrhagic. Bblood test reveled anemia with Hb: 8.4 g/dl (normocytic), white blood cell count was 15.333 x 10^3/ml, CRP was 120 mg/dl, stool studies were negative for infection. Intravenous corticosteroids as well as corticosteroid and 5-ASA enemas were begun and the patient showed clinical and biological improvement (number of bloody diarrhea diminished as well as CRP (40 vs 120). The colitis was then considered an immunomodulator refractory colitis, and we had to consider another treatment to maintain remission.

As the patient was treated for SLE, and due the risk of aggravating this pathology with anti-tumor-necrosis-factor alpha (Anti TNF alpha), we proposed the patient for curative surgery (Colectomy with ileal pouch-anal anastomosis) as an alternative to biological therapy. After explaining benefits and risks of the procedure, and after getting consent, the patient underwent surgery without major complications. She is now regularly followed up in our hospital (University hospital Mohamed VI of marrakech) for her SLE as well as the UC.

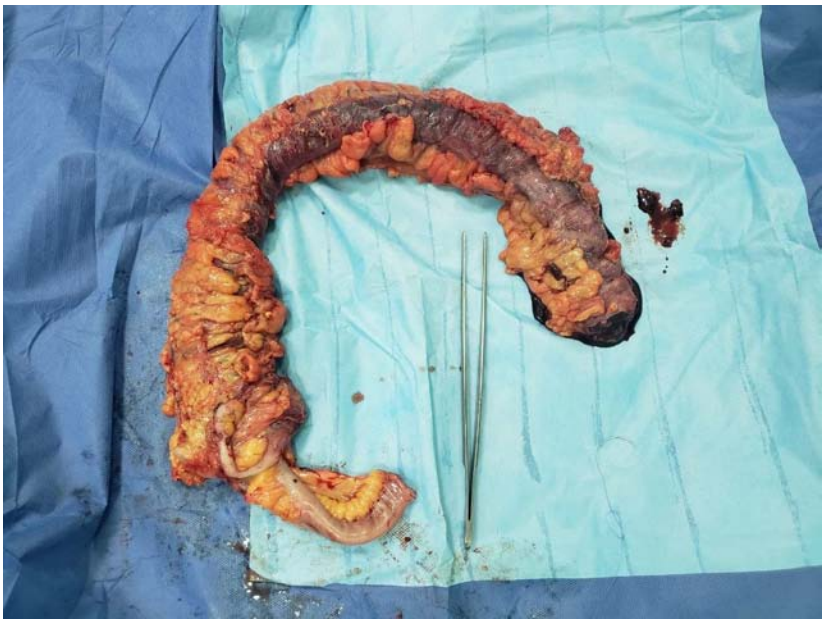

Figure 7: Post-surgery aspect of the colon

III. Discussion

Autoimmune diseases tend to co-exist; however, systemic lupus erythematosus (SLE) and ulcerative colitis (UC) are rarely described together and a systematic review of the medical literature has seldom been undertaken(10). As reported by several authors, the estimated prevalence of UC in SLE patients is around 0.4%(11).

The precise mechanisms of UC remain undetermined, but autoimmune mechanisms are supposed to be involved in the development of UC as well as InSLE. For example, anti-bodies specific to a Mr 40,000 protein found only incolonic, skin, and biliary epithelia have been demonstrated in patients with UC(2).

Around 40% of SLE patients have gastrointestinal problems, of which gastroduodenal mucosal lesions as adverse effects of nonsteroidal anti-inflammatory agents, corticosteroids or cytotoxic agents are the most common. On the other hand, disease itself causes abdominal pain in only 8% of the SLE patients (12).

Main symptoms include abdominal pain, diarrhea, and bloody stool. The symptomatic feature is indistinguishable from that in inflammatory bowel diseases, especially ulcerative colitis(13).

Coexistence of SLE and UC is difficult to diagnose because both diseases have several similar gastrointestinal symptoms and some drugs used to treat UC may cause drug-induced lupus particularly sulfasalazine, 5-ASA, and infliximab(14). So, it maybe difficult to differentiate whether the symptoms are due to the SLE or other diseases. In Lupuscolitis, ulceration with bleeding or perforation is caused by the inflammatory involvement of small vessels and, sometimes, by necrotizing angiitis of small arteries and venules with the deposition of circulating immune complexes (2).

In SLE, Abdominal vascular involvement usually occurs when the disease activity in other organs increases. The evaluation of overall clinical and laboratory findings may help the differential diagnosis (2).

In our case, SLE was considered to be inactive under chloriquine and corticosteroide at the onset of abdominal pain and bloody diarrhea, and typical histopathologic changes of UC such as amicroabscess in the crypt were found in the colo-rectal mucosa.

UC may happen before or after the diagnosis of SLE(14). Our patient was treated for SLE 9 years before developing UC. Many authors described some differences(15)compared to SLE, UC presents more frequently as bloody diarrhea, abdominal pain, and tenesmus.

In all cases, the diagnosis of SLE is made according to the classification criteria for SLE, which necessitate the presence of at least 4 out of 11 clinical and laboratory criteria. The diagnosis of UC is made on the basis of typical clinical, imaging, endoscopic, and histological findings (15).

Our case problematic was related to our therapeutic options, biological therapy was normally indicated for ulcerative colitis, however, the patient was also treated for lupus, and because of the risk of aggravation of SLE after giving anti TNF alpha, we preferred reviewing our options.

To understand the risk of anti TNF alpha induced SLE, we reviewed some cases of lupus like reaction, and DILE (drug induced erythematosus) and its pathogenesis.

Drug-induced lupus erythematosus (DILE) is defined as a lupus-like syndrome temporally related to continuous drug exposure which resolves after discontinuation of the offending drug. There are currently no standard diagnostic criteria for DILE and the pathomechanisms are still unclear. Similarly to idiopathic lupus, DILE can be diveded into systemic (SLE), subacute cutaneous (SCLE) and chronic cutaneous lupus (CCLE). Systemic DILE is characterized by typical lupus-like symptoms including skin signs, usually mild systemic involvement and a typical laboratory profile with positive antinuclear and anti-histone antibodies, while anti-double strand (ds) DNA and anti-extractable nuclear antigens antibodies are rare (16).

Sulphasalazine and Anti TNF alpha have been associated with DILE in several cases in the literature (17). Yet this risk of developing Lupus under anti TNF alpha is very low(17), which leads to asking if we should or not use biological therapy in patients with SLE.

Here are some cases of DILE, in patients treated for UC.

Griffiths and al. (18) report a case of a patient who developed a lupus syndrome while receiving sulphasalazine for ulcerative colitis. They first obtained remission, then the patient developed a non-deforming arthritis with active synovitis of shoulders, wrists, metacarpophalangeal joints, proximal interphalangeal joints and digital vasculiticlesions,. Anti-nuclear antibodies (ANA) were present in high titres with a homogeneous pattern. DNA antibody concentrations were raised (190 U/ml (normal: $<$25 U/ml)).

A drug-induced lupus syndrome was suspected, so sulphasalazine was stopped, cilincal conditions were then slowly resolving. Levels of DNA binding activity and ANA titres remained high for six months after sulphasalazine was stopped, but then fell to normal(18).

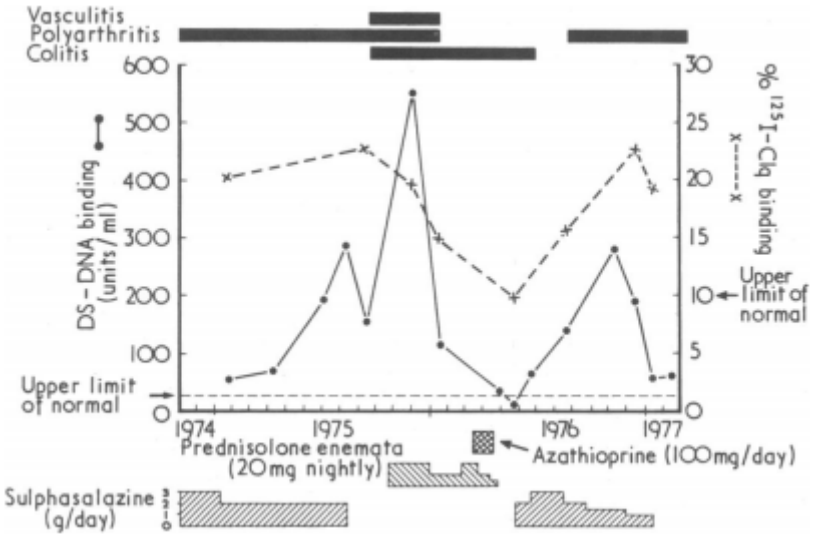

Figure 8: Equential study of clinical features (top), treatment (bottom), and changes in binding activity of double-stranded DNA (DS-DNA) and radioiodinated (1251) complement (Clq)(18).

Another study reviewed 13 cases of DILE due to infliximab in patients with inflammatory bowel diseases IBD(19).

Patient Characteristics	
Median age (range)	37 (26–62)
M:F (numbers)	2:11
CD: UC (numbers)	8:5
Number of patients on concurrent immunosuppression	7
Median (range) duration of infliximab in months prior to DILE	14 (1–52)
Median (range) number of infliximab infusions prior to DILE	10 (2–30)
Re-treated with second anti-TNF agent	8/13=61.5%
Recurrence of lupus like reaction after exposure to second anti-TNF agent	25%
Median (range) period of treatment with second anti-TNF agent	5 months (2–6)

Figure 9: Table summarizing patient characteristics (19)

In these series of patients, DILE was a female-preponderant disease with a female-to-male ratio of 11:2, and 5 patients were treated for ulcerative colitis (19).

In this same series of patients, Joint manifestations dominated. Symmetric large joint arthralgias were reported by all patients. Fever and malar rash were noted in two and three out of the 13 patients, respectively. The antinuclear antibody titer was elevated in all patients with DILE, The median peak antinuclear antibody (ANA) titer was 1 in 2560, Anti-dsDNA antibodies were tested in 12 patients(19).Anti-TNF therapy was withdrawn in all patients upon diagnosis of DILE, and the resolution of joint symptoms was obtained in a median of 4 weeks (range 3–12 weeks)(19).

In our case, the patient was already treated for SLE before developing UC, and did not receive any the DILE causative drugs.

The following cases report the experience of treating patients with SLE as well as inflammatory bowel disease with biological therapy despite the risk early mentioned.

Yamashita and al.(20) report a case of a 55-year-old Japanese woman with systemic lupus erythematosus (SLE), she developed continuous gastrointestinal bleeding and diarrhea since the patient was aged 30 years that was initially treated asSLE-related colitis. The patient underwent surgery for anal fistulas twice at 50 and 54 years of age and her symptoms were atypical of lupusenteritis. Colonoscopy was performed again when the patient was 55 years of age because we suspected she hadsome type of inflammatory bowel disease (IBD). Histopathological examination revealed non-caseating granuloma and no evidence of vasculitis, consistent with crohn's disease (CD). Introduction of infliximab dramatically relieved the patient's melena and abdominal symptoms without aggravating SLE symptoms (20).

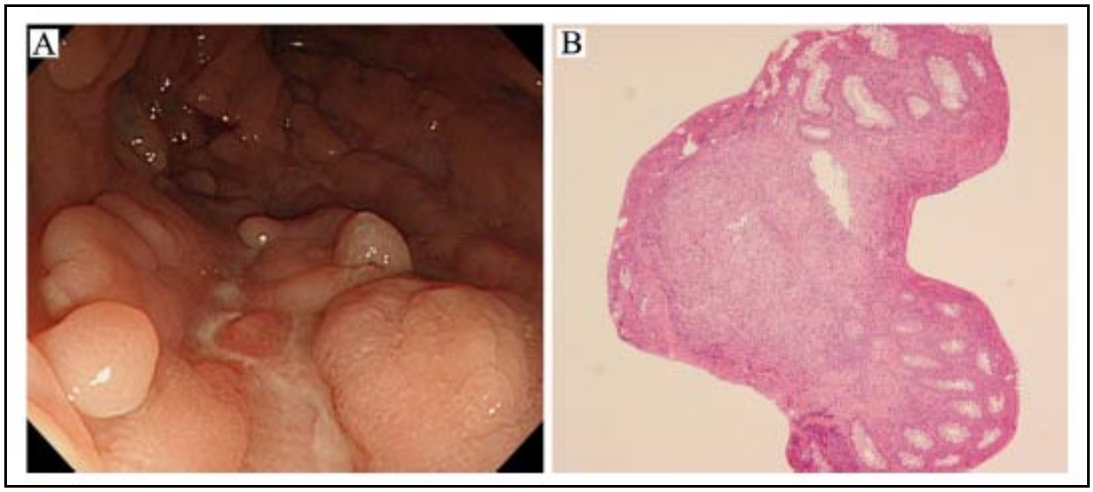

Figure 10: Findings of colonoscopy and colon biopsy specimens. (A) Macroscopic findings of colonoscopy with cobble-stone-like inflammatory polyps and many longitudinal ulcers in the descending colon. (B) Histopathological findings of specimens in A (hematoxylin and eosin, ×100) with non-caseating granuloma and no evidence of vasculitis(20)

Principi and al.(21) report a case of CD occurred in a young woman 8 years after a diagnosis of lupus nephritis according to clinical, laboratory and histological criteria. CD was unresponsive to steroids and immunosuppressants and, therefore, the patient was treated with antitumour necrosis factor alpha monoclonal antibody (Infliximab). This therapy led to the remission of both CD (50% of Crohn's Disease Activity Index—CDAI—decrease) and lupus nephritis (disappearance of pyuria in absence of infection, significant increase of serum albumin and improvement of renal function tests)(21).

In case of steroid dependency or steroid refractory TNF-alpha blockers are an effective treatment to induce and maintain remission. The role TNFalpha plays in SLE is controversial and data on the likely effects of blocking TNFalpha on anti-DNA autoantibody production is always of interest. But those antibodies are not generally associated with clinical signs of autoimmunity and there is no indication for monitoring in patients who have no symptoms. There is no clear explanation for this high prevalence of those autoantibodies (22–25).

There are, however, occasional reports describing the efficacy of anti-TNF-α therapy for SLE. It has also been reported that, despite levels of antibodies to ds-DNA and cardiolipin being increased, anti-TNF-α therapy did not exacerbate SLE itself but rather achieved a reduction in disease activity and relief of refractory arthritis, nephritis(26).

TNF-α exerts both deleterious tissue damaging effects mainly through its pro-inflammatory activities and beneficial activities by dampening aggressive autoimmune responses. SLE is a disease with autoimmune disturbance and inflammatory damage, so blocking TNF-α in this autoimmune-prone chronic inflammatory disease may lead to different outcomes, depending on timing and duration of treatment. Thus, infliximabmay also be effective for gastrointestinal symptoms associated with SLE(27).

To review our therapeutic options we have to define what an immunomodulator refractory colitis is, and search for possible efficient treatment.

Immunomodulator refractory colitis: Patients who have active disease or relapse in spite of thiopurines at an appropriate dose for at least 3 months (i.e. azathioprine 2–2.5 mg/kg/day or mercaptopurine 0.75–1 mg/kg/day in the absence of leukopenia)(28).

Different trials report the benefit of methotrexate and tacrolimus in maintaining remission in UC as second-line immunomodulator Therapies.(28)

The new Zealand society of gastroenterology (28)recommends methotrexate 25 mg weekly for maintaining remission in UC and should be discussed with patients, particularly for those who are steroid dependent.

However, due to the absence of larger, randomised, controlled trials with lengthy follow-up periods tacrolimus cannot yet be considered standard second-line immunosuppression for UC (28).

The American college of gastroenterology recommends using anti-TNF therapy using adalimumab, golimumab, or infliximab to maintain remission in patients with previously moderately to severely active UC (9).

Other therapies have been proposed as an alternative to anti TNF alpha therapy, for patients who are intolerant or who are not responding to it (9).

Vedolizumab is a monoclonal antibody that selectively blocks α4β7 integrin expressed on lymphocytes. A phase III trial investigated the induction and maintenance efficacy of vedolizumab in 895

patients with moderate to severe treatment refractory UC. The study revealed clinical remission rates at week 52 of 44.8% for 4 weekly treatments compared to 15.9% for placebo $p<0.0001$.

Vedolizumab has beed approved by FDA in 2014, and also in many European countries, for the management of moderate to severe UC(28).

Tofacitinib is an oral inhibitor of Janus Kinases (JAK) 1, 2 and 3, resulting in blocking of interleukin 2, 4, 7, 9, 15 and 21 pathways. Patients were randomised to receive twice daily tofacitinib at doses 0.5, 3, 10 and 15 mg and placebo for 8 weeks. Clinical remission rates at 8 weeks of 48% and 41% of patients were seen at doses of 10 mg ($p<0.001$) and 15 mg ($p<0.001$) respectively compared to the placebo rate of 10%(28).

The American college of gastroenterology recommend to facitinib for maintenance of remission in patients with previously moderately to severely active UC now in remission after induction with to facitinib (9).

Thirty percent of patients with ulcerative colitis will eventually come to proctocolectomy and this includes some with troublesome distal colitis. The decision as to whether to proceed to surgery is obviously a big one, with life-long consequences (28).

Removing the colon and rectum in poorly controlled ulcerative colitis restores physical well-being and quality of life (28).

Long-term concerns about neoplasia are put aside. Patients are understandably very concerned about avoiding a "bag". However the starting point of a discussion with the patient about surgery should focus on whether or not the time has come to remove the colon and rectum.

Surgery provides a cure for the colitis, but carries a risk of a variety of short- and long-term complications (28).

There is significant potential for morbidity, but overall greater than 90% of patients are pleased with their resulting health state and bowel function (29).

If optimisation of standard immunosuppression fails in mild to moderate UC, then the main therapeutic options currently available are antiTNF-α therapy and colectomy. While other immunosuppressive strategies exist, they have not been demonstrated to have the same efficacy as antiTNF-α therapy and surgery (28).

To summarize it all, Patients treated for UC as well as SLE can be treated by chloroquine and corticosteroid associated with systemic 5-ASA or immunosuppressive therapy such as azathioprine or 6MP. However, in cases like ours, when the UC is Immunomodulator refractory, treatment to maintain remission can be a real challenge despite different possible options, and differs depending on centers, hospital experience, economic situation as well as patients background.

IV. Conclusion

In conclusion, the diagnostic criteria for UC and SLE overlap, making them difficult to diagnose correctly. Physicians should bear in mind the possibility that a patient may be afflicted with both of these diseases simultaneously. If a patient known to have SLE develops gastrointestinal symptoms such as abdominal pain or diarrhea, it is prudent to rule out UC (30).

Despite some obscure aspects, our case report suggests that the series of UC associated complaints could include a wide range of autoimmune disorders besides those which have been conventionally considered until now. Therefore, a more accurate detection of autoimmune diseases could be suggested in the diagnostic program to be performed in the course of UC (21).

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Histological Features of Scar Tissue Formation in Different Methods of Postoperative Wound Closure

By Malanchuk Vladislav, Zhurakovska Galina, Savosko Serhii & Nataliia Lytovchenko

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Abstract- *The aim* is to study the features of histological and morphometric changes of skin scars in different variants of soft tissue wound closure.

Materials and methods: 60 Wistar rats, divided into 5 groups, were operated on: control group and 4 experimental ones: interrupted (loop) sutures, subcuticular suture, adhesion with dermal glue "Dermabond", interconnection with high freaquency electrocoagulator – HFEW. Skin regeneration and scar formation were studied with histological and morphometric methods on 7th and 14th day.

Results: On the day 7 after the closure of the wound defect, the thickness of the perifocal epidermis was significantly increased by 1.5-2.4 times due to reepithelialization and the formation of granulation tissue. No morphological differences in skin regeneration after interrupted and subcuticular sutures were found. Application of "Dermabond" and HFEW caused progressive increase thickness of the epithelium.

Keywords: *scars, postoperative stage, morphological and morphometric methods, regeneration.*

GJMR-K Classification: *NLM: WO 600*

HISTOLOGICALFEATURESOFSCARTISSUEFORMATIONINDIFFERENTMETHODSOFPOSTOPERATIVEWOUNDCLOSURE

Strictly as per the compliance and regulations of:

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Conclusions: The histological study results showed tantamount efficiency of compared postoperative wound closure methods with tendency to quick development of dermal connective tissue in group that tested HFEW.

Keywords: scars, postoperative stage, morphological and morphometric methods, regeneration.

I. Introduction

Mechanical skin damage is an inevitable consequence of any surgical intervention. As a reaction to trauma, a reparative recovery of skin form and function occurs that results into scar tissue formation [1]. Scar tissue is a natural reaction of organism to a skin damage. A scar formation in such esthetically important regions as face, head and neck can lead to serious psychoneurological disorders, life quality aggravation, imperfect social adaptation of patients and to muscular-skin system malfunction. Hence secondary scar deformities occur in 85% of all surgical intervention cases on face, including affection of face and neck that form 25% of general annual quantity of dermatocosmetological profile patients and this indicator tends to increase [2].

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To choose an optimal method of influence on soft tissue regeneration it is essential to have knowledge of wound process and stages of it`s reparation, that in turn, are a difficult complex of biological reactions [3]. There are such variants of skin wound healing: a healing with primary adhesion, with secondary adhesion, healing under eschar, wounds with complications. An optimal way of soft tissue wounds healing is with primary adhesion, in this way less scar tissue appears, it`s faster and functionally better.

There are three stages during the wound healing with primary adhesion: traumatic swell and inflammation, proliferation, epithelization and scar organization. When healing, the wound fills with blood clots, that prevent infecting and dehydration of wound edges. The blood clot is partially lysed with proteolytic enzymes of neutrophils [4]. Granulation tissue is formed during primary stage of healing. Regeneration occurs due to stem cells of fibroblastic range. General feature of fibrous connective (granulation) tissue is predominance of intercellular substance over cellular component [5].

Major role in wound healing process belongs to connective tissue, cells of which have extremely high reactivity. Reparative histogenesis happens due to growth of connective tissue, it`s cells start to grow from both edges of the wound towards one another and connect wound edges with fibers, that in turn become stronger (are getting sclerosed) and form a firm scar [6]. Great influence on postoperative wound healing and scar tissue formation have such factors as heredity, immune system condition, patient`s age, presence of concomitant diseases and many others. Intraoperative methods of influence on wound healing such as way of wound closure, drainage, hemostasis, surgical debridement, wound infection control etc. are undoubtedly very important also [7].

Despite that there are a lot of scientific studies dedicated to investigation of soft tissue reparative histogenesis, and also to different methods of influence on this complicated process at different stages, this issue remains open and isn`t fully studied. Nowadays there is no clear single algorithm of postoperative wound treatment, that would have had a prophylaxis of pathological scar formation in it`s base. Thereby, in our opinion, there is a need in more detailed studying of

mechanisms and methods of soft tissues reparative histogenesis in maxillofacial region.

The Aim is to study the features of histological and morphometric changes of skin scars in different variants of soft tissue wound closure in the early postoperative stage in an experimental study.

Our aim also was to study and compare histological structure of skin scars in some variants of soft tissue wound closure during early postoperative stage in experimental research.

II. Materials and Methods

The experiments were performed on 60 Wistar rats that weighed 250 – 300 g, without external signs of any diseases from Bogomolets national medical university vivarium. All animals received same standard nutrition and were kept in same conditions. The goal of experimental study was to design a wound model, to close it with different methods and subsequently to evaluate the results of healing. Surgeries were performed under ether inhalation anesthesia, animals were fixed on the surgical table. Antiseptic preparation of surgical field was done with 96% alcohol solution. Every animal received skin and subcutaneous fat cut on the neck, length of the cut was 1,5 cm. Rats were divided into five groups:

Control group (n = 12) – intactanimals – we`ve studied morphological features of the skin;

Experimental group 1 (n = 12) – wounds were closed with interrupted (loop) sutures, Polyamide 4,0;

Experimental group 2 (n = 12) – wounds were closed with subcuticulars utures, Polyamide 4,0;

Experimental group 3 (n = 12) – wound edges were closed with dermalglue “Dermabond”;

Experimental group 4 (n = 12) – wounds were closed with soft tissue welding with high-frequency live tissue electric welding device–EKVZ300 PATONMED (HFEW).

Animals were derived from experiment on 7th and 14th day with inhalation anesthesia overdose, 6 animals from each group. Material intake was performed from healing area in every animal to conduct histological study of skin regeneration

Statistical study was carried out using the Origin Lab program, version 8.0. The normal range of the results was estimated by the Kolmogorov-Smirnov criterion. The Kruskal-Wallis test was used for analyses of the intergroup discrepancies. $P < 0.05$ estimated as significant different.

Bioethics. All manipulations with laboratory animals were conducted due to norms of Directive № № 2010/63/ЄС about animals protection, that are used with scientific aim, the Law of Ukraine «About animals protection from cruel treatment» (№ 3447-IV від 21.02.2006).

III. Results and Discussion

A research of skin reparative processes after traumatic damage started from analysis of skin morphology of control group animals. An intact rats` skin had undamaged epidermis, derma and hypoderm, some skin derivatives (hair and sebaceous glands) (Fig.1). General skin morphology of rats` skin is similar to human`s skin, but has some differences: epidermis is less stratified (layers are less differentiated, stratum corneum and thicker granular layer and stratum basale are detected); dermal connective tissue forms weakly expressed papillas, contains rich density of hair follicles and sebaceous glands (pilomotor muscles are also registered); hypoderm is built of adipose tissue and has centers of areolar tissue in some areas. We`ve detected striated muscle tissue under the skin, that doesn`t belong to a skin structure, but might be damaged during skin defect design. Morphological features of intact rats` skin and quantity indicators of epidermis, which were gained with morphometric method (Table 1), were chosen as control ones for comparison with experimental groups.

In experimental group 1, after interrupted (loop) sutures, an area of skin defect and morphological signs of skin regeneration were registered. 2 samples (33,3%) with defect of epidermis and weak epithelium regeneration were detected on 7th day. Other 4 samples had more active regenerative signs of epidermis, that filled a traumatic defect. Regeneration included enlargement of epidermal thickness in the area of epithelization due to proliferation in stratum basale and often in the wall of hair follicle (in the root sheath) (Fig 1). A defect area in derma had granulation tissue: high density of fibroblasts and infiltrated macrophages, regenerated blood vessels, increased density of collagen fibers. Hypoderm was poorly expressed under a skin defect, often was reorganized with granulation tissue. Subcutaneous muscle tissue was also damaged, it`s muscle fibers were atrophic, diameter and density were significantly decreased. According to morphometric results, a regenerative epidermis thickness was statistically considerably greater on 7th day than the control value, that is connected mainly to proliferation processes. The thickness of epithelium on 14th day was also greater, but within limits of statistical uncertainty. Extent of the defect area in derma (zone of granulation tissue formation) also tended to decrease due to tightening of this area, connective tissue development, thus processes of skin defect healing.

In experimental group 2, after subcuticular suture, morphofunctional features of regenerative processes were similar to those, described in group 1, although some differences were detected. A significant epidermal defect with weak epithelization was marked in 1sample (16,7%) on 7th day. Regeneration in other samples (83,3%) was more essential: the thickness of

epithelization area, density of proliferation centers in stratum basale and root sheath increased (hair root was damaged with destruction of layers). Thickness of epidermal layer in reepithelization area was statistically considerably greater than control value; differences within group 1 wasn`t detected (including due to thickening of stratum corneum) (Table 1). Granulation tissue in derma contained regenerative connective tissue, infiltration of macrophages cellular detritus (against the background of regional inflammatory reaction). Defect area (granulation tissue) tended to increase in comparison to group 1, that had an impact on muscle fibers atrophy under the skin defect and deeper in growth of granulation tissue (hypoderm is absent when subcuticular suture is used). Regenerative processes on the level of hair follicles on 14th day were more intense compared to 7th day (an increase of root sheath cells quantity) (Fig. 1).

In experimental group 3, after dermal glue usage, a greater thickness of reepithelization area was registered (statistically significant difference to group 2, $P<0,05$). Epidermal layers stratification reconstruction is detected (regeneration of stratum corneum and granular layer), regeneration of hair follicles and sebaceous glands. Statistically considerable differences among groups on 14th day wasn`t stated (Table 1), despite some authors marked benefits of using dermal glue above closing with interrupted sutures (esthetically better scar appearance, though strength of scar tissue is approximately the same to one, closed within sutures) [8, 9, 10].

In experimental group 4, after HFEW use, structural changes in defect area were similar to ones, described earlier. HFEW caused increased formation of eschar, that was detected on 7th day, though it has detached later (Fig. 1).

Thus skin regeneration appears in regenerative epidermis thickness increase, which is explained by active posttraumatic reepithelization of the defect area and restoration (enlargement) of granular layer of epidermis, that was greater in 1st and 2nd groups on 14th day. A relative preservation of appendages of skin was detected in derma, especially sebaceous glands, that are potentially a source of epidermis regeneration, other authors also mention that [11]. A stage of granulation tissue development and it`s cell density was less on 7th day compared to other experimental groups (statistically considerable difference in comparison to group 2), but no difference was detected on 14th day. A partial preservation of hypoderm was also identified (discrete areas of adipose tissue were found prifocally to a defect area), though muscle tissue under the defect also suffered atrophic changes (a decrease of diameter and density of muscle fibers).

IV. Conclusions

1. Histological manifestations of reparative process in injured rats` skin were similar in different ways of wound healing. Reepithelization of damaged area proceeds and granulation tissue develops in derma in dynamics. A preservation of appendages of skin in derma, hair follicles in particular, is a potential source of epidermis regeneration.
2. The extent of dermal defect increases after subcuticular suture and, in addition, an inflammatory reaction with formation of cell detritus is possible, that increases the development of scar tissue.
3. Reparative processes in epidermis after electric welding technic on 14th day are marked in reepithelization and granulation tissue development increase in the dermal defect area compared to interrupted (loop) suture and to dermal glue “Dermabond”.

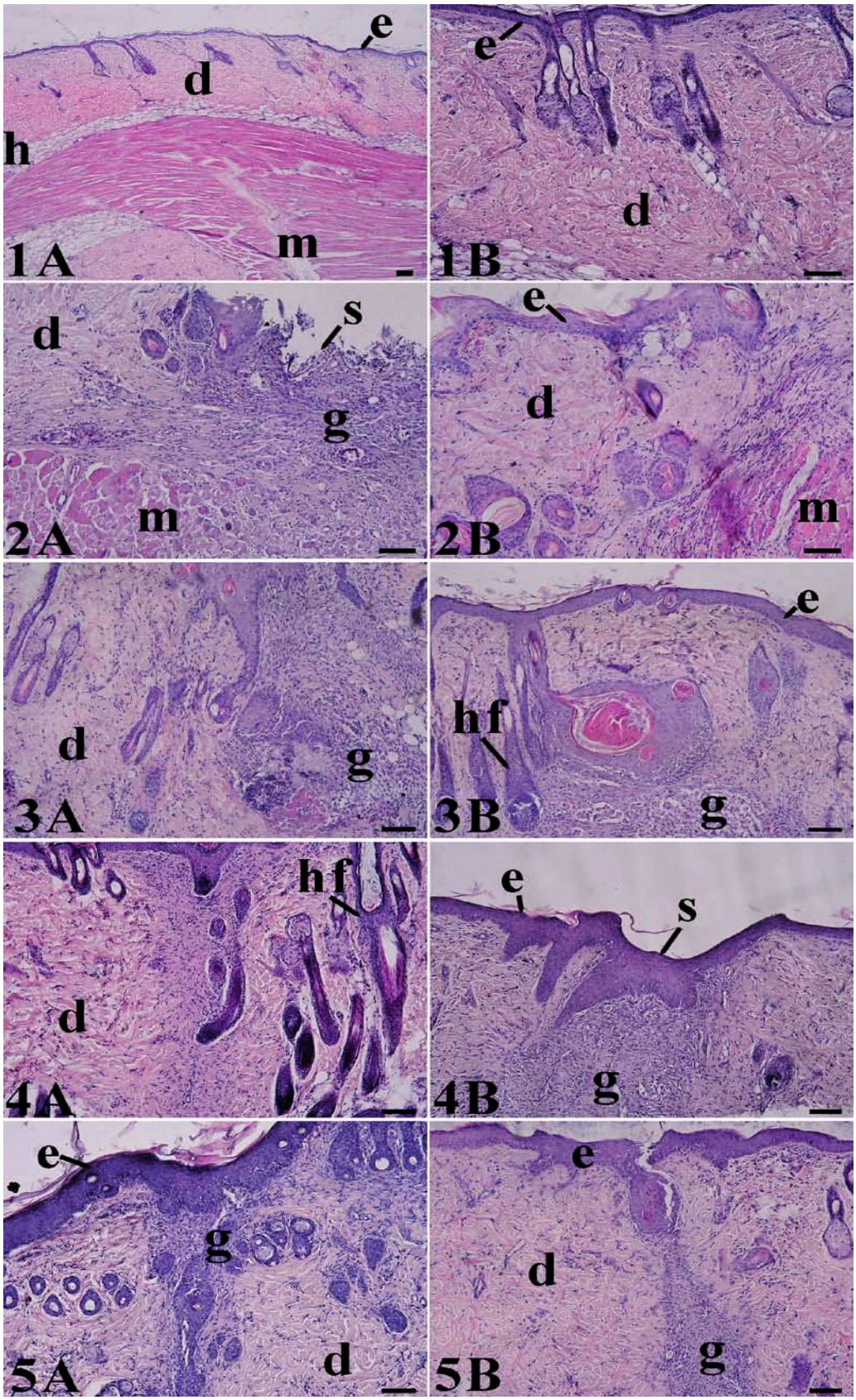

Fig. 1: Intact and injured rat skin after different variants of soft tissue wound closure. Note: 1 – control group; 2 – group 1; 3 – group 2; 4 – group 3; 5 – group 4; A – 7th day; B – 14th day; e – epidermis; d – dermis; h – hypodermis; m – muscle tissue; hf - hair follicle; s – skin defect; g – granulation tissue. Hematoxylin-eosin, scale bar 100 μm.

Table 1: Morphometric data of skin defects (Me [Q1-Q3])

Group Value	Thickness of epithelium layer, μm		Granulation tissue area, μm	
	7th day	14th day	7th day	14th day
Control	73,7 [65,7-80,0]		-	
Group 1 Interrupted (loop) suture	108,8 [89,0-127,7]*	89,2 [67,2-109,7]	1023,2 [683,9-1367,6]	890,3 [666,5-1101,9]
Group 2 Subcuticular suture	101,7 [72,79-158,1]*	89,0 [74,4-106,3]*	1324,0 [1018,0-1703,7]	989,4 [809,5-1277,3]
Group 3 "Dermabond"	184,3 [143,4-294,5]*#	113,3 [91,9-121,4]*#	952,9 [583,8-1494,4]	1107,3 [878,9-1473,6]
Group 4 HFEW	126,4 [91,3-194,7]*	150,1 [101,5-159,1]*#@	939,4 [515,9-1201,9]#	1013,2 [833,9-1224,9]

*Note: * - significant difference with the control group (P<0,05); @ - significant difference with the group 1 (P<0,05); # - significant difference with the group2 (P<0,05)*

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Interdisciplinary
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Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Communicating Science through Art. Victorias Cells Project

By Vittoria Lombardo

The Specific Objective- Victoria's cells project was created from the idea of easier training of healthcare personnel and facing theoretical and practical aspects of improving communication. This innovative method allows one to associate benign and malignant cellular images and/or patterns characterized by a wide range of shapes and color shades, evoking animals, common objects, and colorful aquariums with features easily memorized by analogy under the microscope. The project implies different sections subclassified using different iconography able to draw the viewer's interest and easily memorize the cytological interpretations and describe practical interventions to promote effective communication in cancer screening with different, new, and interactive information tools.

GJMR-K Classification: *QU 300*

COMMUNICATINGSCIENCETHROUGHARTVICTORIASCELLSPROJECT

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Communicating Science through Art. Victorias Cells Project

Vittoria Lombardo

I. The Specific Objective

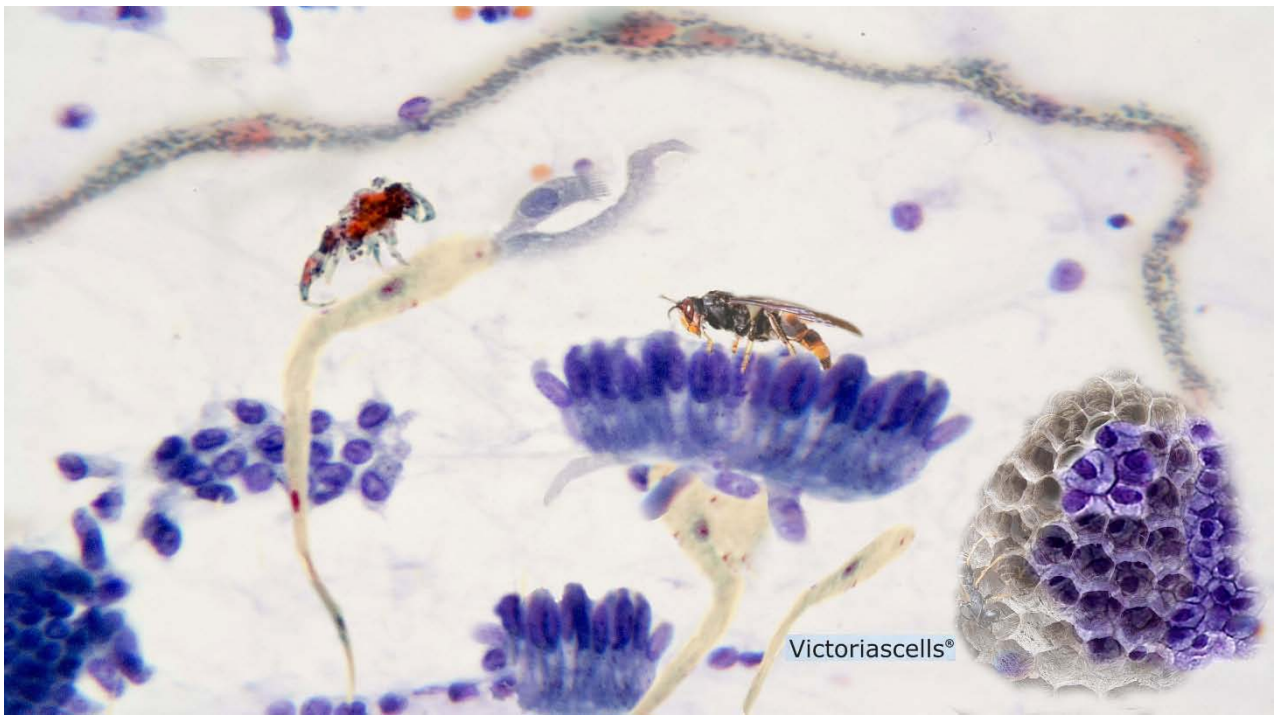
Victoria's cells project was created from the idea of easier training of healthcare personnel and facing theoretical and practical aspects of improving communication. This innovative method allows one to associate benign and malignant cellular images and/or patterns characterized by a wide range of shapes and color shades, evoking animals, common objects, and colorful aquariums with features easily memorized by analogy under the microscope. The project implies different sections subclassified using different iconography able to draw the viewer's interest and easily memorize the cytological interpretations and describe practical interventions to promote effective communication in cancer screening with different, new, and interactive information tools.

II. Materials and Methods

Cervicovaginal cytology (Papanicolau staining) processed with conventional and liquid-based cytology (LBC).

III. Results

The images are visual of the impact that communicate and educate about the importance of studying cells and their diagnostic role and significance, in order to bring the population closer to prevention. The pictures can be organized into different sections, embracing diagnostic iconography.



IV. The Bee

Endocervical cells in all prospects with few immature bee-shaped squamous cells.

Metaplasia recalls the sea turtle's shell or mycetes resembles a starfish. A 3-D sly cat of endometrial cells, a tender little elephant of squamous cells, a dog, and a koala of keratinized cells. Other preparations resemble endocervical and squamous cells resembling fish tanks, a geisha of keratinized squamous cells, or a plunging diver of granulocytes. Furthermore, a hummingbird of endometrial cells, soars in flight, in a sea of endocervical cells mimicking water lilies and peonies. The section of malignant mockery is composed of SIL patterns looking like monsters, eyes,

Author: *e-mail: vittoria.lombardo19@gmail.com*

or a foul tongue, while AGC resembles an eagle and feathers.

V. Conclusions

The recognition of visual images can make the study of cytology simpler and enjoyable leading to the final purpose of prevention and cure.

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New Explanation of the Cortisone Cycle – Why at 3 am we are Awake, Die, and Give Birth

By Prof. Maria Kuman, PhD
Holistic Research Institute

Abstract- The article offers explanation of the cortisol cycle. The secretion of cortisol from the adrenal glands starts at 3 am. This makes the cortisol level in the blood stream high at the morning, which determines our high body energy and immune abilities at the morning. After 3 pm the amount of cortisol in the blood starts to drop down fast to prepare us for the night rest and sleep. While all other cyclic reactions in the body are ruled by sun light, there is no light in 3 am to activate the secretion of cortisol. At 3 am our breathing is minimal, and this is the time when the majority of people die (and the majority of babies are born). The Earth has maximum temperature at 3 pm, which makes its ionosphere and atmosphere maximally extended, and minimum at 3 am. Thus, it seems that our cycle of breathing is in synchrony with the Earth cycle of breathing, and this is what activates the cortisol cycle at 3 am.

Keywords: cortisol cycle; cortisol and breathing cycle; our and Earth's breathing synchronized; only morning-taken cortisone.

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Keywords: cortisol cycle; cortisol and breathing cycle; our and Earth's breathing synchronized; only morning-taken cortisone.

I. Introduction

Research shows that the body is dramatically different in the morning and at the evening. The same glass of poison when drank in the morning will not harm you, but when drank at the evening will kill you [1]. What makes the body so different is the amount of cortisol (the active form of cortisone) in the blood, which determines our body energy and immune abilities. There is a cycle of cortisol secretion [2]–the hormone is secreted by the adrenal glands on top of the kidneys. The secretion of cortisol starts at 3 am when the breathing has its minimum and with the increase of the cortisol level, the life energy in the body starts to increase. When the amount of cortisol (life energy) reaches high enough value, we awake with the feeling that we have slept well, we have rested enough, and we are full of energy ready to start the new day.

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II. The Cortisol Cycle is not Ruled by Sun Light

Our scientists presently believe that all rhythmic processes in the body are ruled by light [1]. However, there is no Sun light at 3 am to activate the cycle of cortisol secretion. If the light cannot be triggering the cortisol secretion at 3 am, then what is? Our breathing has minimum at 3 am and maximum at 3 pm. But what rules the cycle of breathing? I am going to show in this article that not the Sun, the Earth rules the cycle of breathing.

Dr. Pierrakos, was a medical doctor in New York, who was not only seeing the auras of his patients, he was diagnosing them based on what he sees in their auras. He was not only seeing the pulsating dynamics of their auras, he was also seeing the pulsating dynamics of the energy field of the Earth. The maximal temperature on Earth (at the Sun side) is at 3 pm, and this is the time when the Earth has maximally extended ionosphere and atmosphere, as if breathing energy in with a maximum breath intake at 3 pm… and minimum at 3 am ([3], p. 212). Amazingly, the cycle of human breathing is the same as the earth's breathing – our auras are maximally extended and our lungs are maximally active at 3 pm and minimally active at 3 am.

III. My Studies of the Aura (SPIRIT)

I spent more than 30 years of my life first photographing the aura and then developing and patenting sensitive equipment to be able to measure it (because it is 1,000 times weaker than the field created by the biocurrents of the body). My measurements showed that the aura is emotional – it shines brighter when we experience positive emotions (or just think positively) and it is dimmer when we experience negative emotions (or just think negatively) [4]. Since when we experience positive emotions (or just think positively), we feel in high Spirit and when we experience negative emotions (or just think negatively), we feel in low Spirit, I concluded that the aura must be our emotional Spirit.

Then I found that the Advanced Jewish Cabala was teaching to high priest that the aura is our Spirit. What happens when we experience positive emotions that we feel uplifted? The Russian scientist Shkatov developed equipment that allows him to measure the spinning of the aura. He found that positive emotions

make the aura spin clockwise [5]. Since nonlinear physics teaches that vortices spin clockwise and sick energy in, this explains the energy uplift when we experience positive emotions, which makes us feel in high Spirit. Shkatov found that negative emotions make the aura spin counterclockwise. Since nonlinear physics teaches that anti-vortices spin counterclockwise and emit (loose) energy, it become obvious why negative emotions make the aura dimer and make us feel in low Spirit.

With measurements, I found that the aura (Spirit) is weak nonlinear electromagnetic field (NEMF), and I was able to measure its vortices and anti-vortices. If our aura is NEMF, and positive emotions make aura's NEMF to spin clockwise and suck energy, NEMF energy must be available to be sucked in. Is this the Space-Matrix NEMF, from which everything material was created? It was called ether in the past [6]. If the ether is NEMF, this explains why the existence of ether (Space Matrix) was questioned for so long: 1/it is invisible NEMF, and 2/ it is too weak to detect - it is 1,000 times weaker than the field created by the biocurrents of our body. However, I found with my measurements that this weak NEMF (Spirit) rules and regulates everything in the body - not with its strength, but with the information it caries.

The NEMF (as all nonlinear fields do) does not dissipate and can imprint information. That is why the Space Matrix, from which everything material was created, was NEMF [6]. First, a sphere of not dissipating NEMF (Space Matrix) was created and then the three-dimensional holographic image of the Universe to be was imprinted on it, and the Universe was created [7]. Now, let's go back to what exactly happens in the human body at 3 am? At 3 am, when the breathing reaches its minimum, the Spirit (aura) becomes activated. It starts spinning clockwise and sucking NEMF energy from the Space Matrix. The body life-energy start increasing preparing the body for awakening. This activates vortex #1 of the aura (Spirit) NEMF (called "first chakra") (Fig. 1), which rules the adrenal glands, and they start producing cortisol ("chakra" means "spinning wheel" in Sanskrit).

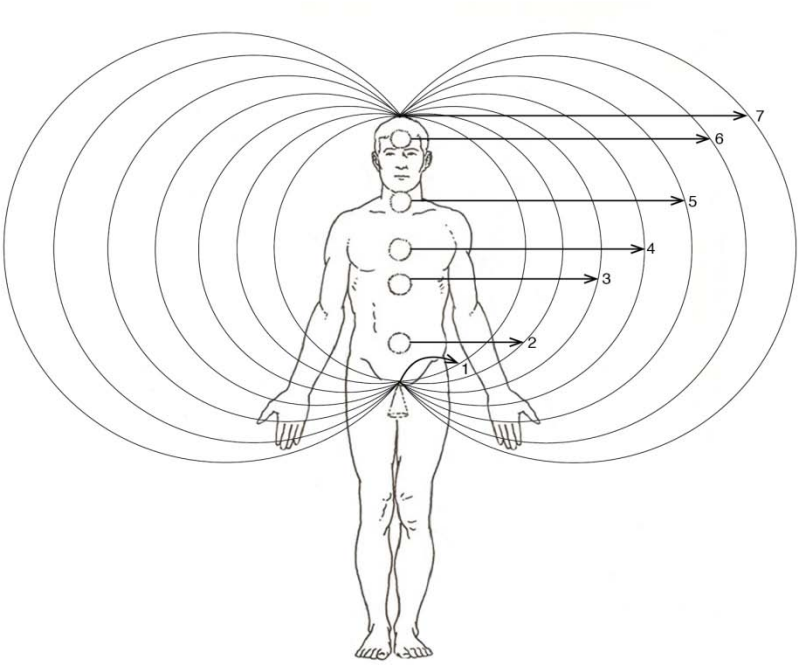

Fig. 1: Man's aura (Spirit) NEMF with its alternating vortices and anti-vortices along the backbone (chakras) and their corresponding energy levels

Thus, the clockwise spinning of the Spirit (NEMF) after 3 am and the NEMF energy it sucks from the Space Matrix NEMF, is what activates the secretion of cortisol, not the Sunlight as our scientists presently believe [1]. At 3 pm, to prepare the body for sleep, the Spirit (aura) starts spinning counterclockwise and loosing energy. After 9 pm the Spirit (aura) starts spinning faster counterclockwise and loosing energy faster. As a result, the body energy substantially decreases, and we are starting to feel sleepy. The lowest energy is at 3 am when the breathing is minimal. This minimal breathing is what triggers the switch – the Spirit start spinning clockwise and sucking NEMF energy from the Space Matrix.

IV. Why are People Dying and Babies are Born at 3 am?

The spinning Spirit is magnetically attracted to the field of the material body. If the material body is old and worn out and does not have energy to spin and magnetically attract the spinning in opposite direction Spirit, the Spirit NEMF leaves and the person die. This explains why most of the people die at 3 am – the minimum of the cycle of breathing [1]. This also explains why most of the babies are born at 3 am [1]. My explanation is - the minimum breathing at 3 am triggers the Spirit to start spinning again clockwise and suck NEMF energy from the Space Matrix. This gives the energy for the final push of the baby out. In this way, the newly-born baby takes its first breathing at 3 am – the beginning of the cycle of breathing. After 3 am, our clockwise spinning Spirit continues to suck NEMF energy from the Space Matrix NEMF, thus preparing us for the activities of the oncoming day.

V. We are Material Body and Aura (Spirit) NEMF

Thus, we are a material body and Spirit, which is NEMF, and the Spirit is the one that energizes the body and rules and regulates the body functioning. The higher energy of the Spirit in the morning is what causes the abundant secretion of cortisol in the morning, which makes the morning body so different from the evening body [1]. Ancient acupuncture teaches: if you want to stimulate, always do this in the morning when the energy grows because it is like swimming in the direction of the river flow. If you want to sedate, always do this at the afternoon when the energy decreases because it is like swimming in the direction of the river flow [8].

VI. Conclusion

A natural question arises: If our body is so different in the morning and the evening, shouldn't we give different doses of medication in the morning and at the evening? The equal dose of drug prescription 3 times a day is done for simplicity, but if applied to cortisone it could be deadly. The cortisone prescription should take into consideration the cycle of cortisol secretion. If so, the drug cortisone should be prescribed to patients only in the morning to imitate the natural secretion of cortisol in the body. However, since cortisone causes cancer, it should be prescribed only for saving life.

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The corresponding author should mention the name and complete details of all co-authors during submission and in manuscript. We support addition, rearrangement, manipulation, and deletions in authors list till the early view publication of the journal. We expect that corresponding author will notify all co-authors of submission. We follow COPE guidelines for changes in authorship.

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Appealing Decisions

Unless specified in the notification, the Editorial Board's decision on publication of the paper is final and cannot be appealed before making the major change in the manuscript.

Acknowledgments

Contributors to the research other than authors credited should be mentioned in Acknowledgments. The source of funding for the research can be included. Suppliers of resources may be mentioned along with their addresses.

Declaration of funding sources

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Preparing your Manuscript

Authors can submit papers and articles in an acceptable file format: MS Word (doc, docx), LaTeX (.tex, .zip or .rar including all of your files), Adobe PDF (.pdf), rich text format (.rtf), simple text document (.txt), Open Document Text (.odt), and Apple Pages (.pages). Our professional layout editors will format the entire paper according to our official guidelines. This is one of the highlights of publishing with Global Journals—authors should not be concerned about the formatting of their paper. Global Journals accepts articles and manuscripts in every major language, be it Spanish, Chinese, Japanese, Portuguese, Russian, French, German, Dutch, Italian, Greek, or any other national language, but the title, subtitle, and abstract should be in English. This will facilitate indexing and the pre-peer review process.

The following is the official style and template developed for publication of a research paper. Authors are not required to follow this style during the submission of the paper. It is just for reference purposes.

Manuscript Style Instruction (Optional)

- Microsoft Word Document Setting Instructions.
- Font type of all text should be Swis721 Lt BT.
- Page size: 8.27" x 11'", left margin: 0.65, right margin: 0.65, bottom margin: 0.75.
- Paper title should be in one column of font size 24.
- Author name in font size of 11 in one column.
- Abstract: font size 9 with the word "Abstract" in bold italics.
- Main text: font size 10 with two justified columns.
- Two columns with equal column width of 3.38 and spacing of 0.2.
- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
- Line spacing of 1 pt.
- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
- The names of second main headings (Heading 2) must not include numbers and must be in italics with a font size of 10.

Structure and Format of Manuscript

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

a) A title which should be relevant to the theme of the paper.
b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
c) Up to 10 keywords that precisely identify the paper's subject, purpose, and focus.
d) An introduction, giving fundamental background objectives.
e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
f) Results which should be presented concisely by well-designed tables and figures.
g) Suitable statistical data should also be given.
h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
j) There should be brief acknowledgments.
k) There ought to be references in the conventional format. Global Journals recommends APA format.

Authors should carefully consider the preparation of papers to ensure that they communicate effectively. Papers are much more likely to be accepted if they are carefully designed and laid out, contain few or no errors, are summarizing, and follow instructions. They will also be published with much fewer delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and suggestions to improve brevity.

Format Structure

It is necessary that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

All manuscripts submitted to Global Journals should include:

Title

The title page must carry an informative title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) where the work was carried out.

Author details

The full postal address of any related author(s) must be specified.

Abstract

The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

Many researchers searching for information online will use search engines such as Google, Yahoo or others. By optimizing your paper for search engines, you will amplify the chance of someone finding it. In turn, this will make it more likely to be viewed and cited in further works. Global Journals has compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Keywords

A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, “What words would a source have to include to be truly valuable in a research paper?” Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

Numerical Methods

Numerical methods used should be transparent and, where appropriate, supported by references.

Abbreviations

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

Formulas and equations

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

Tables, Figures, and Figure Legends

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.

Figures

Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

Preparation of Eletronic Figures for Publication

Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/ photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution at final image size ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs): >350 dpi; figures containing both halftone and line images: >650 dpi.

Color charges: Authors are advised to pay the full cost for the reproduction of their color artwork. Hence, please note that if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a Color Work Agreement form before your paper can be published. Also, you can email your editor to remove the color fee after acceptance of the paper.

Tips for writing a good quality Medical Research Paper

1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

2. Think like evaluators: If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of medical research then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

5. Use the internet for help: An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.

6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

The Administration Rules

Administration Rules to Be Strictly Followed before Submitting Your Research Paper to Global Journals Inc.

Please read the following rules and regulations carefully before submitting your research paper to Global Journals Inc. to avoid rejection.

Segment draft and final research paper: You have to strictly follow the template of a research paper, failing which your paper may get rejected. You are expected to write each part of the paper wholly on your own. The peer reviewers need to identify your own perspective of the concepts in your own terms. Please do not extract straight from any other source, and do not rephrase someone else's analysis. Do not allow anyone else to proofread your manuscript.

Written material: You may discuss this with your guides and key sources. Do not copy anyone else's paper, even if this is only imitation, otherwise it will be rejected on the grounds of plagiarism, which is illegal. Various methods to avoid plagiarism are strictly applied by us to every paper, and, if found guilty, you may be blacklisted, which could affect your career adversely. To guard yourself and others from possible illegal use, please do not permit anyone to use or even read your paper and file.

Criterion for Grading a Research Paper (Compilation) by Global Journals

Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals.

Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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