



Opinion Article

Human Factor: Aging and Medical Errors

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Abstract

The purpose of this work is to study the impact age has on medical errors. In making analogies for this research, documents and literature related to the subject matter were gathered by searching for keywords in search engines and scholarly sites. By taking happenings and studies from journals and works across the world, an exhaustive research was carried out by the researcher to make reasonable conclusions on the topic. This paper also critically analyses the human physiology and juxtaposes it with what is obtainable in the sports and medical profession tries to find an answer to these rising numbers. This is especially the case since advocates and patients have continued to hold campaigns to the high rising number of deaths caused by medical errors.

Introduction

The medical profession is one, which is seen as prestigious in all seven continents of the world. Doctors are regarded as highly-placed individuals in the society because of the tremendous role they play in saving lives and maintaining a balance society in any economy. With the advent of new technological spheres, more branches of medicine are being introduced into the world, paving way for medical doctors to pursue specializations in more areas. The medical world is enjoying all the benefits that come with more standardized processes made available by both years of restructuring learning curriculum, to years of repackaging the practical aspects of medical procedures and the advances in technology [1]. However, even with the level of growth and development being witnessed in the medical field, there tends to still be a high level of death as a result of medical errors. One then begins to wonder why these errors continue to occur at alarmingly high numbers across the world.

In the past couple of years, a lot of individuals and agencies have sought answers to the questions concerning medical errors and its link to the age of doctors. A lot of studies have pointed at different factors as being responsible for these issues. While some have pinpointed factors like age, length of study, technology, cultural practices, etc. as leading variables, others have remained inconclusive with respect to what the reason(s) might be. Literature made available by the John Hopkins hospital shows that medical errors are responsible for the cause of death for approximately 250,000 [2] people in US. However, other sources have pegged this figure at close to 440,000. These reports also state that these errors are the third major causes of death across the US, following other

medical issues like heart diseases and cancer [3]. Also in Australia, the literature remains slightly the same as the deaths arising from medical errors are noted to be 11% of the annual death rate [4].

This research work focuses on more on the role played by factors like age, as affected by the length of study. In taking a new approach, which involves critically analyzing the physiological aspect of life, more insight is provided for further study. The researcher in juxtaposing what is obtainable in the medical field, with the factors and realities faced by sportsmen in their chosen field tries to make a possible connection to the subject matter [5]. Basically, the researcher hopes to ascertain whether or not physiological factors that are common with aging are responsible for the medical errors experienced by doctors after a certain age in their careers. By using selected case studies of two cricket players (Ricky Ponting and Waqar Younis), more light is shed on these ideas.

Methods

In conducting this research work, data was sourced from secondary sources. A major chunk of information was obtained by searching for key word related to the subject matter. Such words include 'medical errors', 'causes of death', 'error in medical spaces' and 'physiological changes in sportsmen'. Sites used for this work include PubMed, Google and Google scholar. The researcher spent a great deal of time ensuring that no stone was left unturned in finding articles and statistics that are linked to sport men's performances, as well as the performance of the medical doctors. By taking searching for articles which have direct analogies on the level of years of practice spent by individuals in

both fields, as well as the age demographics when they experience their peak period, the researcher is able to identify basic traits and factors that can be held accountable for this feat.

Discussion

About the Game of Cricket

The exact origin of cricket has been traced to the sixteenth century England. In the years that followed, the sport was appreciated more and more across several countries as Britain continued to colonize more and more regions and introduce the sport to their newly colonized zones. The game is governed by the International Cricket Council and has a total membership of over a hundred players. All rules and regulations that are applicable to the game of cricket are found in the Laws of Cricket which is under the maintenance of the Marylebone Cricket Club situated in London. Several other locations where the sport is currently enjoyed include West Indies, South Africa, India, UK, Ireland and Australasia [6].

Cricket just like the popular game of football is played by two teams of eleven players each. However, unlike football, it makes use of a bat and ball on a rectangular-shaped field, which measures a total of 20 yards. Three wickets or targets are erected at the end of each side, which consist basically of three wooden stumps and two bails.

Each session of the game, otherwise known as innings is characterized by one side batting and attempting to make as many runs as possible while the opposing side bowls and fields, in an attempt to interfere with as many runs as possible. At the end of each inning, sides are changed and each team does what the opposite of what it was doing before. Each team get the chance to bat twice, in a test match, which lasts for 5 days and considered as the highest level of cricket. A winner emerges after these four rounds and winning is based on the number of runs a team makes. In cases where a clear-cut victory cannot be ascertained, extra points gained are included as part of the determinants of who emerges as the winner [7].

At the start of the match, the captains of both sides pick either heads or tail of the coin and it is thrown in order which side has the opportunity to strike first. After this, eleven players from the bowling side and two players from the batting side will get on the pitch to commence the game. The batsmen are known as the striker and non-striker. The aim of the striker is to hit ball as hard and far enough to make more runs, the non-striker is sighted close to the bowler. The bowling team's challenge is to ensure that they block all potential runs of their opponents or dismiss their opponent. They are able to dismiss their opponents when he or she declared 'out'. Such a person must then leave the field and a team mate will be sent in as a replacement. Three scenarios that can lead to the dismissal of a player include; when a bowler hits the stumps directly and dislodges the bails, the use of a batsman's body to prevent the ball from hitting a stump or when a fired ball is caught by the opponent before it touches the ground. Both teams earn points either when the ball is hit hard enough for it to pass the

limit or when the locations are switched by batsmen (as the fielders try to retrieve the ball) [6].

Several officials are present during a game of cricket. Some of them include three umpires and a referee and two scorers who stay off the field and take note of match statistics. The types of cricket matches vary also. Two notable examples are Twenty-Twenty (T20) and one-day matches. While the first match lasts for 3 hours, the second match is played over 7 hours and consists of 20 and 50 overs each side, respectively [7].

Case study A: Ricky Ponting

Born on the 19th of December 1974, Ricky Thomas Ponting is one of the biggest players in the history of the game. He won his international recognition after winning a two-time world cup title as captain in the 2003 and 2007 world cup tournaments for his country Australia. These tournaments pushed him to the prime light as one of the most amazing batsmen of the era. His significance and dexterity led him to become the Australian team captain between 2004 and 2011. His main function on the team was in the capacity of a batsman, although he functioned also as a catching field. He also seldom played the role of a bowler. During the course of his career, he was named the Cricketer of the Decade in the year 2000.

During his domestic career, he played with the Tasmanian Tigers a team in the Domestic Cricket category of Australia and also Hobart Hurricanes in his country's T20 tournament known as the Big Bash League. Becoming a part of the Kolkata Knight Riders later in his career, the team with whom he featured in the premiership. He broke a record on the 1st of December 2006, becoming the best test batsman of the last five decades, a record which was broken 11 years later by Steve Smith in December 2017. Ricky Thomas is regarded as the most decorated Tasmanian player.

At just seventeen years of age, he made his debut entrance for Tasmania in 1992. At that point, this was the youngest recorded age for any player to take part in the Sheffield Shield Match. His One Day International Debut came three years later in New Zealand where Australia played against South Africa. His first Test Debut was in Sri Lanka. In the years that followed up to 1999, he went on and off the national team because he was not in form and lacked discipline. However, by 2002, he got his act together and became the ODI captain in 2002 and the test captain by 2004.

He played in 160 Tests matches and 370 ODIs and became a leading run scorer in both categories. He and three other cricket players (Sachin Tendulkar, Rahul Dravid and Jacques Kallis) are the only four cricketers known to have test score runs of thirteen thousand (13,000). As a captain, his team had 48 wins in 77 test games between 2004 and 2010. In his career, he was personally involved in a hundred test victories and 262 wins in the ODI category.

In 2012, it was announced that he would make one last match before leaving the scene for test matches, leaving the world

surprised. On 30th November 2012, he made his final appearance as a test cricketer in his 168th career game. His test batting average at the end of his career was 51.8.

In February, he became the captain of the Mumbai Indians. This ushered in the last season of his career. He retired from all forms of cricket after this.

Case Study B: Waqar Younis

Waqar Younis Maitla with Pakistani origin was just like Ponting, a test and ODI captain for his home country. Unlike Ponting however, he was a fast bowler and was recorded to be one of the best bowlers of his time. He currently works as the coach of fast bowling in the Indian Premier League as a coach for the year 2018.

As far as the game of cricket is concerned in Pakistan, he became the youngest ever test captain at the age of 22 years. Worldwide he was the third-youngest captain. His international career lasted from 1989 to 2013 and he made 87 appearances in test matches and 262 appearances in ODI matches during this period. His trademark was his reverse swing which was known to send the ball sprawling at a fast pace. In total, he took three hundred and seventy-three test wickets and four hundred and sixteen ODI wickets. He is also known as the best the player with the second best strike rate, closely behind Dale Steyn.

He was the coach of the Pakistani national team from 2006 to 2007 after which he resigned for personal reasons. After this, he went ahead to become the bowling coach of Sunrisers Hyderabad in preparation for their premiership in the year 2013.

Merging Both Scenarios

A look at the life of both athletes shows one that they both enjoyed a great deal of prominence during their entire careers. One also sees that they had to go through rigorous forms of training to become forces to reckon with. However, just like other athletes, they both retired in their thirties.

Education in the Medical Line

The time spent on obtaining a medical degree differs from country to country. In the first place, for some countries like Nigeria, it is possible to enter the medical college directly from high school. In other countries like the Philippines, Belarus and Russia, people who seek to obtain these degrees have to do it on a postgraduate level. What this means is that they must first complete an undergraduate or a prerequisite course in the science field before being admitted into the medical college [8]. On the average, it takes six years to become a doctor in all the countries mentioned. Although some may be seven depending on the arrangement and requirements of the program.

However, it is pertinent to understand that for medicine, education never truly ends after the college experience. This is because one continues to pass exams that usher one into a new phase of the medical profession. After the six years in college, most practitioners go further to become interns. After their internship,

which lasts a year, depending on the program, they have to take further exams to become junior registrars. At the successful completion of their residency program, they take more exams to become senior registrars, before taking their final examinations to become consultants. Therefore, on the average, it takes an average of ten to fifteen years to reach the peak of one's medical ladder. This reasoning of course, is based on the assumption that no hitches are met during one's program and one does not take a voluntary break during the course of the program [1].

So, for an eighteen year old who takes his first class in college to start off things in the medical field, the average age at which he might reach the peak of his career is plus or minus thirty-three.

The working of the human physiology

Human physiology can be defined as the study or science of how human organs and tissues function. The idea is to analyse the compositions of these human organs in order to understand how they function mechanically, physically and biochemically [7].

Does the human physiology play a role in determining the peak period of an individual? By seeking to understand the mechanism that helps the human body stay alive and keep functioning, physiology tends to play a tremendous role in determining how well the human body functions. It also plays a great deal in ascertaining the underlying causes behind how human beings function.

One might wonder why this is so. The reason is simple. Aspects of the human body such as the nervous and endocrine systems are essential for the reception and transmission of signals as well as the integration of functions among humans and animals. Therefore, when changes occur in the physiological compositions of humans, there happen to be traces of possible impact on mental capabilities of these individuals, especially people who have been on medications that have side effects. Also, studies have shown that most old people tend to lose some amount of strength at percentages ranging from 1.5% per year and of power at some 3.5% per year within the age bracket of 65 to 84 [4].

The entire career of numerous athletes has been known to follow the frequency of the normal curve. What this means is that at some point, their ability to perform at an optimum capacity begins to gravitate negatively, leading to a lower level of performance, which in the long run leads them to forced retirement. Such patterns can also be plausible in the medical line since the human body, irrespective of profession is made up of typically the same components [21].

Is age a cogent factor that affects man's adaptation to the use of technology?

The use of technology in the medical field is of very high importance. This is because even the basic steps that have to do with activities like checking the patient's vitals, recording patient information, running lab tests, as well as undergoing several other medical and surgical procedures etc. all have the use of tech at

their core. It then becomes imperative for medical practitioners to be able to move with these trends in technology in order to remain relevant in their chosen areas of specialization [5].

However, studies have shown that as individual age, their ability to grasp the working mechanisms, whether technology related or not continues to dwindle. Some medical conditions that become more prominent with age (such as Alzheimer's) as well as bad eyesight can also contribute considerably to a lower adaptation rate in medical doctors. As such, in most cases, age poses serious problems to the degree of precision and an individual's ability to make use of technology [10].

However, it is essential to note that age is not the only factor responsible for medical errors especially with respect to technology. This is because lapses in technological systems can also pose serious problems especially when their integration processes are faulty.

Reasons for the record of more errors in western countries

A lot of factors have been attributed to the high number of medical errors recorded in western countries. The most recurring of these factors is the lack of data on health indexes in developing countries and its availability in developing countries have made it impossible to compare the degree of errors in both fragments [1].

In some third world countries like Nigeria for instance, data collection faces a lot of challenges. For instance, the last census that was conducted in the country was done in the year 2006. Even during this census, some areas were left uncovered as a result of geographical barriers as well as other minor issues such as difference in languages. This means that for over ten years, no real value data has been collected on the number of people living in the country. As such, other important indices such as the total number of births and deaths are done based on what is available via hospital data, interpolation or extrapolation [10].

How lack of data poises a problem in developing worlds

The following have been outlined as problems lack of data causes in developing countries.

- Lack of real value figures: as has already been explained, this means that the data available on websites and publications are merely estimated values. They do not represent the exact number or value of indices.
- Problem in planning and implementation of policies: since the data available are merely approximate values, it becomes hard to plan and implement policies. For instance, it is either estimations fall under or above what is needed, or the entire program flops due to misrepresentation or misinterpretation of data.
- Difficulty in comparison: it becomes hard to compare results of what is obtainable in developing regions with what is obtainable in developed countries, making difficult to strategically pinpoint what might work in each area. It also becomes difficult to ascertain why things which work in one area might not be favorable in another area.

- Physiological approaches in improving physical performance

The way forward

From the results and information gotten during the course of this work, the following propositions have been put forward as possible ways to deal with the issue of medical errors worldwide.

Change in Curriculum

The first point of call should be series of roundtable and inter-country sessions to check and test the possibility of editing the current curriculum being used in medical schools in order to ascertain whether or not it would be possible to alter this curriculum and reduce the number of years spent on obtaining a medical degree.

Adoption of the 'do nothing' approach:

Where the first option seems flawed, the do nothing approach can also be examined (in combination with other factors) as a way forward to tackling the issue of medical errors. Problem-solving usually involves an in-depth analysis of a subject matter to decide the way forward. However, in scenarios like this, it becomes very difficult to make changes to the already existing procedures. The reason for this is simple. Medicine deals with human lives. What this means basically is that doctors are charged with the responsibility of saving human lives and any little mistake can lead to death. This explains the rigours taken to ensure that individuals are properly prepared with concepts that get them ready for the job ahead. Therefore, nothing can be done to shorten the number of years spent in medical school.

Welfare packages

Welfare packages should be made available for doctors during and after their services in the medical line. In some countries, people continue to operate and render medical services even in their old age because of the additional income they hope to achieve. However, if they know that they will be well taken care of, more people would be glad to accept the offer of retirement.

Educational prospects

Asides rendering one's physical services in hospital facilities, errors can be checked in older surgeons move from say surgeries to classrooms. This way, it becomes possible for them to remain relevant and impact the next generation, even if they are faced with one impediment or the other.

Nutrition and healthcare

Research can be further bolstered to ensure that doctors eat right and have access (and time) to get proper medical check-ups. This way, their quality of life will be enhanced and errors resulting from the occurrence of medical illnesses will be reduced.

Other important steps that can be taken like the use of more productive or effective rotation systems, to ensure that doctors are never overworked.

Overview of the Discussion

Death caused by medical errors have been attributed to several factors such as lack of skills by medical personnel, age, indiscriminate use of drugs, defect in the existing system, mix-up of patients' medication as well as surgical complications. An analysis that covered an eight year frame shows that about 9.5 per cent were caused by medical errors [10]. More fingers are being pointed towards the systems as being major causes of these errors rather than the individuals. For this purpose, this work tries to analyse whether or not age and physiology have an effect on the errors.

Conclusion

This work through qualitative analysis to ascertain the major factors that contributes to medical errors in medical systems across the world. The point of focus was on age and physiology and how they affect the working mechanisms in human beings, taking case studies from cricketers to make more elaborate investigations. Other determinants of medical errors besides the age factor were outlined. Finally, recommendations were given as to the possible solutions that can be given to the problems at hand.

Authors' Contributions

The sole author is responsible for the concept and design, data collection, interpretation and statistical analysis, literature search, manuscript writing and editing, critical revision and final approval for publishing.

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