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Far Reaching Repercussions of Diabetes Mellitus on Cardiovascular Health of Middle-Aged People

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Abstract: ***Over the years the word Diabetes has been the bane of many a patients across the world. Millions of people fall a victim to diabetes every year and suffer the harmful consequences for their lifetime. Though it is no longer a life threatening ailment as it once used to be but it could be fatal if the patient sidelines necessary precautions. The study conducted in the city of Kota aims to highlight the scourge of Diabetes and its lethal effects on the cardiovascular health of middle aged people who are the most potent victims. Though it's well known that uncontrolled blood sugar levels lead to Diabetes among the middle aged but over a span it gradually impacts their heart which starts malfunctioning and may even collapse if the condition keeps worsening. The study was randomly conducted on a sample set of 50 middle aged individuals between 35 to 65 in age residing in the city of Kota and undergoing treatment for Type 2 Diabetes. The sample was sourced from a hospital in the city which allowed us to interact with the patients. The results were surprising and somehow validated the beliefs. Though, there wasn't exactly a strict correlation between the two but the data and its analysis later indicated that unduly high blood sugar level does have a long term impact on the heart of individuals. Contacting the patients and seeking their responses was a tough job but a meticulous approach made it possible to collate the results and reach an informed conclusion. Since all the individuals in the sample set were diabetics, getting responses from them regarding the health of their heart and connecting it with their pre-existing conditions held the key to the whole study. Although they were all on strict medication for Diabetes, their related heart ailments were forcing them to ingest pills to keep their hearts in check and in some respondents the ailment was grave enough and worthy of a serious consideration. Although majority of them just started off as diabetics but on the way picked heart related disorders and were forced to undergo special treatment for that.***

Keywords: Scourge, ailment, correlation, collate

I. INTRODUCTION

Diabetes has been a silent killer ever since humanity came to know of it. It has spanned continents, communities, age groups and almost every diversity human has known. It has troubled the people to no limits and is one of the few ailments that are known to bring about a massive upheaval in the life of patients.

The patients diagnosed with Diabetes undergo a radical change in their chosen pattern of life and have to overhaul the complete mechanism that defines their life and career. Not just that, their relationships, their jobs and occupations get altered beyond conceivable limits once they get to know they are diabetics and have to start living a very different life than what they had thought about earlier. On the face of it, the description sounds simple. When pancreas in human body doesn't produce enough quantities of insulin that is required to oxidize blood sugar, the sugar levels over a period of time shoot up dramatically bringing about indescribable harm and one of the most serious assaults blood sugar may inflict upon human body is that on the Cardiovascular health of the patient. It's often medically diagnosed as either a condition where sufficient insulin isn't produced or the human body resists or blocks insulin thereby rendering it ineffective in controlling blood glucose. As such, Diabetes is even referred to as a lifestyle disorder which may result out of a sedentary life a person chooses where his consumption remains optimal in terms of variety but his physical exertion stays minimal. Over a period of time, quite unassumingly his blood sugar levels surge making his health vulnerable to harms.

The symptoms are quite palpable and mildly vary from individual to individual. The people suffering high blood sugar levels complain of excessive thirst, undue hunger and pretty much frequent urination. In fact, diabetics are commonly found fatigued for no obvious reason. Another usually heard problem of diabetics is their diabetes induced blurring of vision. They often find themselves visiting their ophthalmologists and very frequently experience a change in the metrics of their lenses. In the midst of all these manageable problems, the one most unmanageable seems to be the nasty hit their heart takes. It is said the heart is the most severely affected if blood glucose levels stay consistently high for a prolonged period.

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Diabetes is known to gradually damage minor blood vessels of the circulatory system which suddenly increases the blood pressure thereby, making the patient more likely to suffer a heart attack or a stroke. Medical journals recently reported a study that diabetics are 40% more likely to develop an irregular heart beat also termed in medical jargon as Atrial fibrillatio. It is also reported that glucose levels steadily erode the inner linings of arteries which indirectly doesn't allow oxygen rich blood to reach the heart which may increase the chances of a stroke. A patient with Type 2 diabetes is thereby more susceptible to a cardiovascular disorder and if a cardiovascular ailment pre-exists with a hypertension, it may disproportionately affect the severity of Type 2 diabetes.

II. OBJECTIVES

A. To evaluate the severity of cardiovascular disorders reported among the Diabetics surveyed in the sample set.
B. To assess the number of diabetics undergoing medication for cardiovascular disorder as well.
C. Analyzing the common symptoms reported among the middle aged diabetics surveyed.
D. To assess the usual lifestyle patterns of the diabetics surveyed.
E. To also evaluate the fooding habits of the diabetics in the sample set.

The Chosen objectives were in line with the need of the whole research. As the research has centered around the impact of Diabetes Mellitus on the cardiovascular health of the patients, the objectives have been designed keeping in view the kind of answers expected and their effect on the conclusion. Though it's already medically proven that diabetes aggravates the add-on miseries of the patients, still the chosen objectives helped in designing the tools effective enough to be able to reach an informed conclusion. Middle aged people who were the members of the sample set are likely to have a life quite different from a younger age group, as such the objectives were set keeping in view the age of the sample set. Additionally, the objectives selected were in league with the pattern of life opted by the patients as choosing a style of life physically more exhausting than the other could potentially make a person more prone to diabetes and thereby, more likely to pick a cardiovascular problem as well.

III. MATERIALS AND METHODS

A. Selection of Subjects

A random sample of 50 people suffering from Diabetes Mellitus were sourced from a local hospital in the city which had allowed us to have their details, though it had been a tough time explaining them the reason for the research. These subjects had at some point or the other been in touch with the hospital seeking medical consultation for their diabetic condition. It was kept in mind that all were in the age group 35 to 65 as the research was on middle aged people. Also since we were only tracking Type 2 Diabetes which is prevalent in this age group. Additionally, it was remembered that this is the age group where leading a less physically active lifestyle is a kind of norm. Though, this age group is believed to be cautious with their consumption habits but owing to their weak metabolism is more prone to higher sugar levels and also potentially susceptible to cardiovascular ailments.
Since all the chosen subjects were already diabetics and were undergoing treatment for their respective conditions, it was much easier to correlate their cardiovascular health with their blood glucose levels. Another rationale for choosing this age group was that a lot many patients have certain other pre-existing medical conditions and are being administered medication for that which might result in a few complications when treated alongside diabetes and cardiovascular disorders.

B. Questionnaire

A detailed questionnaire consisting of questions seeking answers upon various lifestyle choices of respondents was prepared and was handed over to the selected subjects to choose the response that suited them the best. Since the target sample set wasn't expected to describe in detail their current medical status, the questions designed were close ended anticipating objective replies.

1) Questions regarding medication for diabetes and blood pressure to assess the pills they were consuming and for how long. It was expected to reflect what simultaneous medication was keeping them fine in the face of the problems, diabetes as well as cardiovascular disorder.
2) They were also queried regarding the physical exhaustion they were normally subjected to. This was expected to throw up statistic about how much they exerted themselves.
3) Their dietary preferences were also questioned because diabetes as well as Cardiovascular conditions both result out of a sugary high fat and low fiber diet. The questions were expected to reveal what most of the subjects ate in routine which caused them to suffer from both the ailments at the same time.

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4) The respondents were also queried regarding the sequence of both the disorders. Which in a way means, were they first diagnosed for diabetes or did they first pick the problem of high blood pressure and irregular heartbeat.

5) The questions were pretty simplistic and helpful for the patients to answer as complicated questions would have made it difficult for them to give compact answers thereby, obfuscating the results.

C. Dietary Practices

Apart from the usual reasons, what these middle aged people eat makes up most of what they accumulate in their bodies. Though, most cardiovascular patients and diabetics are advised to go for green leafy vegetables and fruits, majority of them pretty much ignore these advisories and go for diets rich in sugar and salt both of which carry a seriously bad reputation when it comes to matters of heart. Infact, quite amazingly, both diabetics and cardiovascular ailments carry similar warnings in terms of foods to be avoided. The food that is considered a serious threat for Diabetics as well as cardiovascular patients is diet with excessive salt, sugar and fat. Even refined carbs to a certain extent are considered to be a drag upon a patient's heart. Though, patients with cardiovascular problems are restricted from consuming meat diets, especially red meat, even diabetics have to face prohibition from fat-rich red meat. Even white rice, bread and pasta pose a risk to the heart as well.

The planned questionnaire focused on questions pertaining to the food preferred commonly by patients and also the advices they were given on what to include and what not to include in their routine diets. The rationale behind such questions was that patients with either diabetes or cardiovascular ailments are found to be a bit reckless with their food preferences and are often guilty of consuming foods which they are strictly restricted from. People with heart related disorders are normally advised to go for fresh vegetable diet so, that they could keep their weight in check. Obesity is normally counted as one of the major precursors to cardiovascular problems. People on the heavier side of the scale are considered to be more likely to pick cardiac errors and obesity could only be kept at bay by consuming foods that aren't fat rich. The same goes with Diabetes as well. The correlation between the two is unmistakable and thus, people with poor eating habits are an easy prey to cardiac as well as diabetic disorders. Even sugar-rich diets trigger obesity thus, making obesity a common cause among both diabetic and cardiovascular disorders. Further, saturated fats coupled with lack of any exercise gradually make a patient's heart weak and vulnerable enough to bear any assault.

IV. ANALYSIS OF DATA

The data was collected with the help of questionnaire that consisted of queries related to their lifestyles, their consumption patterns, their physical fitness and the treatment they were undergoing for any pre-existing disorders. The idea was to judge whether these diabetics had been facing any cardiac problems since the time they were diagnosed as diabetics. Their answers were initially gathered in a tabular form and graphically represented so as to get a real feel of the problem. It was expected that the data gathered would help in determining any possible relation that might exist between high glucose levels and cardiovascular problems.

	05 Years	10 Years	15 Years	20 Years
No. of Persons	26	12	07	05

Table 1: Duration of Diabetic and Under Practitioner Supervised Medication

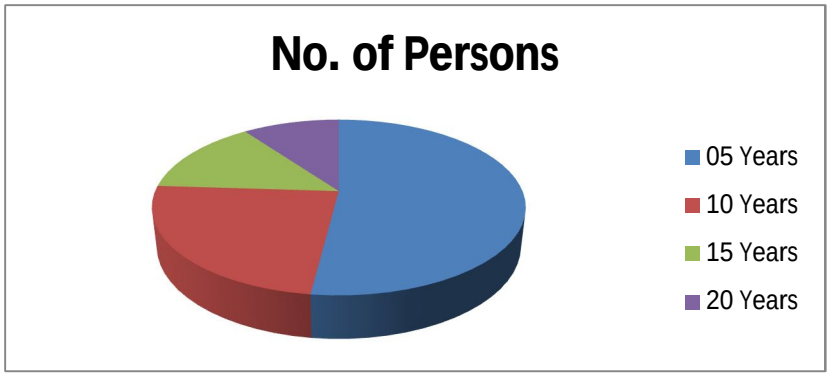


Figure 1: Shows Diabetic Respondents for Last 5 Years

A big chunk of 26 respondents have been a diabetic for the last 5 years out of a sample set of 50 and around 12 were diagnosed with the disorder ten years back which effectively means that the people being questioned were suitably chosen to be respondents for the research. There were also a few who contracted the disorder around 20 years back. All the chosen respondents were being administered medication.

Jogging	Brisk walking	Weight training	Skipping	No exercise
9	16	3	2	20

Table 2: Data Related to Exercise Regimen as Directed By a Practitioner

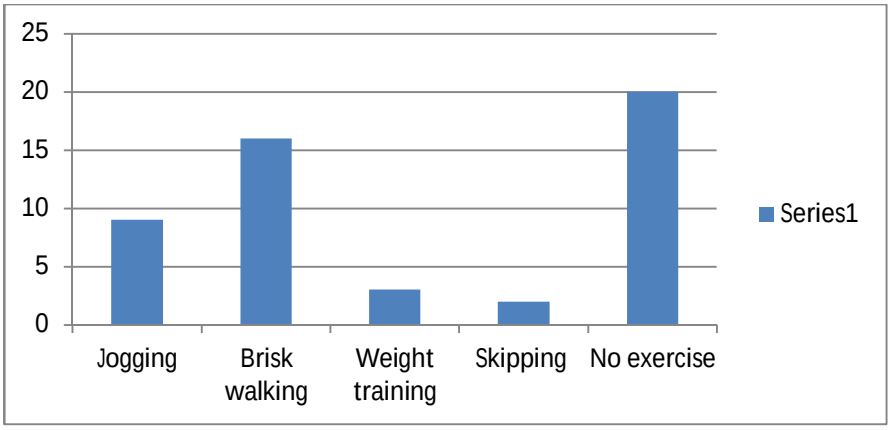


Figure 2: Presents Difference in Exercise Regimen

The data evidently proves that a majority of respondents are the least active when it comes to physically exhausting oneself. Almost 20 admitted that they aren't involved in any kind of exercising regimen which maybe is the reason behind their current condition. Though a few among them jog and indulge in brisk walking but a large number of them hardly tire themselves and this explains why they developed high sugar levels over a span of time. This also in a way reflects why majority of people with growing age tend to accumulate glucose levels in their blood streams as consumption patterns remain the same whereas there is hardly any attempt at burning the sugar they have amassed.

Shakes and ice creams	17
Meat diet	09
Deep fried snacks	28
Rice and potatoes	34

Table 3: Consumption Patterns of Respondents

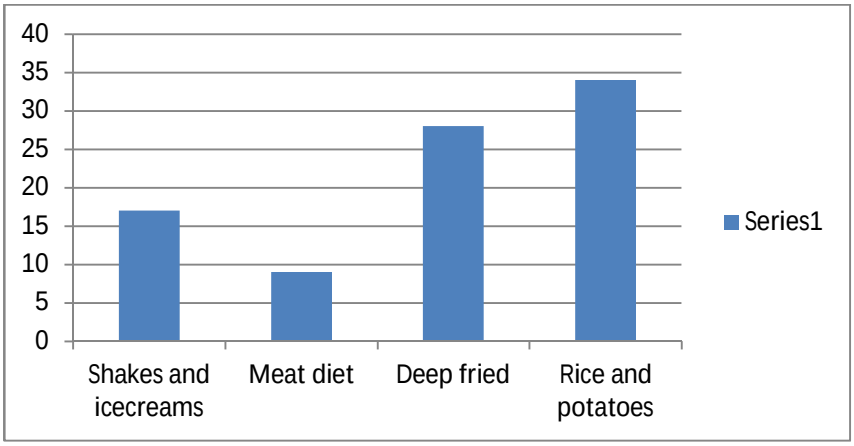


Figure 3: Shows Consumption Patterns of Respondents Revealing Their Unhealthy Diets

The consumption patterns of the respondents reveal their unhealthy diets and also to a large extent show how majority of them love eating fat-rich deep fried snacks which are a potential threat to human heart in growing age. Further a considerable number of them indulge in shakes and ice creams which are a rich source of sugar and add up to boost sugar levels with the passage of time. Additionally, a vast majority of them admitted that they regularly consume rice and potatoes which have been proven over a period of time to be a source of carbohydrates which in an excessive quantity may prove detrimental to heart as well as increase blood sugar levels.

Severely High BP	18
Mildly High BP	29
Normal	03

Table 4: Depicts Diagnosed With High Blood Pressure

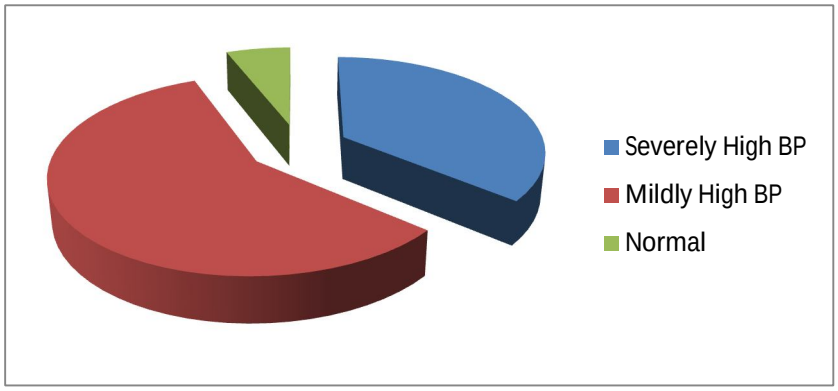


Figure 4: Shows Majority of Diabetic Respondents Suffered With High Blood Pressure

The statistic clearly indicates that a majority of diabetics in the age group 35 to 65 suffered a high Blood Pressure which in itself reveals a classic characteristic of diabetics. It's well known that blood vessels lose their elasticity because of excessive blood sugar thereby resulting in the constricting of blood vessels. This makes it difficult to maintain a normal flow and the blood pressure shoots up dramatically. Almost 29 out of 50 respondents had a constant mildly high BP problem and around 18 reported instances of recurring severely high BP. This effectively validates that Diabetics are pre-disposed to picking cardiovascular disorder sooner or later.

Suffered a heart stroke	13
Often feel Uneasy	26
No	11

Table 5: Respondents Ever Suffered a Heart Stroke or Severe Uneasiness

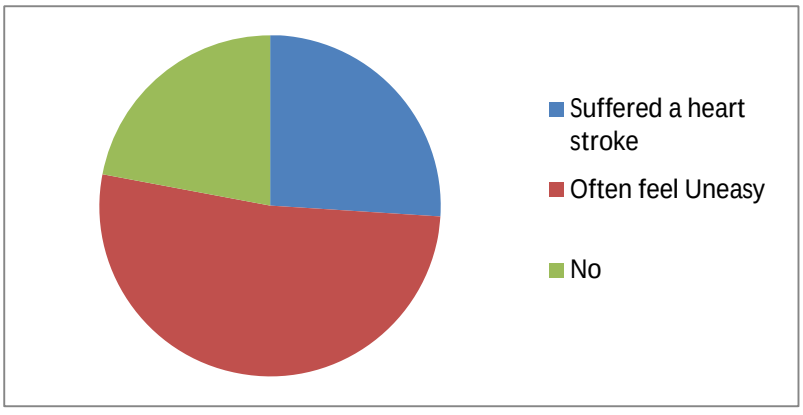


Figure 5: Reflects Most of the Diabetic Respondents Are Susceptible To Uneasiness and Heart Stroke

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The data quite clearly reflects how much diabetics are susceptible to heart stroke and uneasiness. More than half the respondents from the sample set suffer uneasiness quite often whereas almost a quarter responded that they had suffered a heart stroke. Diabetics usually have high blood glucose and the condition is referred to as hyperglycemia which is known to affect the functioning of lung. This in turn causes shortness of breath. This may lead to uneasiness quite often and if the condition worsens it may even lead to a heart stroke and sudden death. This inter-connectedness between diabetes and Cardiovascular ailments is all too common and has often been blamed for sudden death among the severe diabetics.

V. CONCLUSION

A. It was found after the analysis that a majority of diabetics had developed heart conditions not long after they were diagnosed with diabetes. This to a great extent proves that being a diabetic led to cardiovascular complications.

B. It was clearly revealed after analyzing the data that majority of the diabetics had a sedentary lifestyle which even led to obesity and thereby an added pressure on the blood vessels leading to a High Blood Pressure.

C. It was also seen after identifying the data that the consumption patterns of all the diabetics were a fat and sugar rich diets which gradually damaged their blood vessels as a result enhancing the blood pressure. Also, they were found to be consuming too much of unhealthy carbohydrates which are not just a source of glucose but over a span create cardiac disorders as well.

D. The data also revealed that some amongst the sample set had already suffered a heart stroke and were taking precautions under medical supervision. A lot many among the sample had on multiple occasions complained of uneasiness and had even been treated for that.

VI. RECOMMENDATIONS

1) Since diabetics are pre-disposed to cardiovascular ailment, it is advisable that they should pursue an active lifestyle that comprises vigorous exercises if possible so as to be able to maintain a good metabolism. Also, an active metabolism keeps the heart healthy.

2) It is also believed that an inactive lifestyle develops insulin resistance. On its part insulin resistance leads people to gain weight. And being overweight puts a lot of strain on the health which may cause a heart failure. An active lifestyle is highly recommended as it helps in avoiding insulin resistance.

3) It is advisable that middle aged people with diabetes should be cautious about their consumption habits. Fat-rich diet should be a taboo for them. They should rather put more stress on fruit and vegetable diet. This would increase rich fiber intake and thereby rectify problems with metabolism. In turn it would even take care of diabetes as well as any cardiovascular problem that an individual might have contracted over a period of time.

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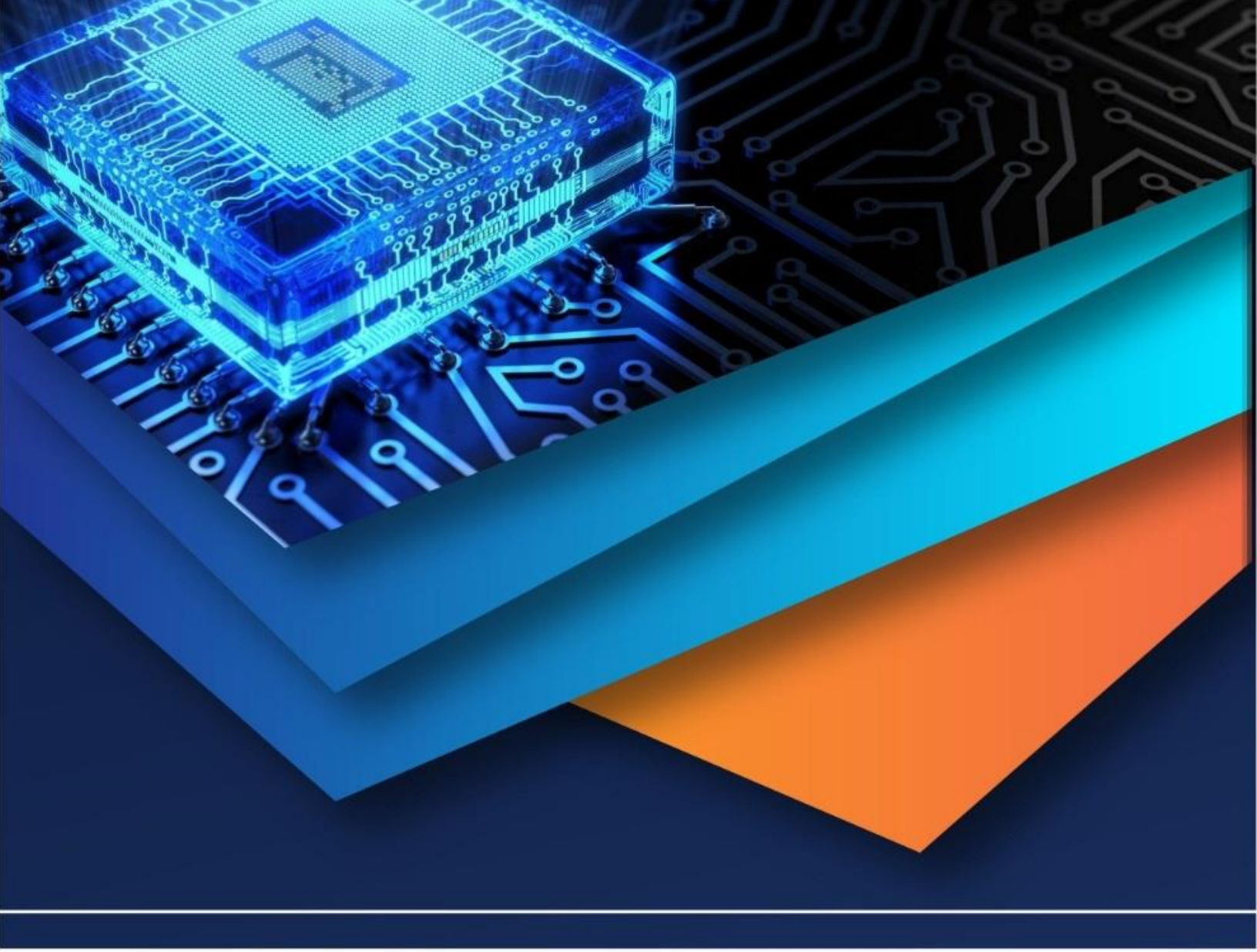
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