BIOCHEMICAL SENSOR FOR BRAIN TUMOURS SURVEILLANCE WITH ARTIFICIAL INTELLIGENCE

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Abstract: In the surveillance of brain tumour for human beings, the use of different types of biochemical sensors with artificial intelligence bring effective changes in the medical field. In that case, the biochemical sensor can measure the activities of the cerebrospinal fluid that help to detect the tumour in the brain. On the other hand, this sensor transfer different types of active bio signals to the AI and the uses of different kinds of algorithms by the AI can analysis the real-time condition in effective ways. In terms of the importance of the of biochemical sensors in the surveillance of the changes in the brain tumour, this diagnostic process offers effective results which help the patients to get personalized treatment as per their needs and increase the satisfaction level among patients. In terms of disadvantages, the availability of media expertise and as well as getting technical issues are the main disadvantages which create negative impacts on the cost of the treatment and increase the times for treatment. Finally we conclude that the both factors comparative results through AI % with biochemical sensors form data analytics.

Keywords: *Artificial intelligence, Cerebrospinal fluid, Biochemical sensor, Bio signalling etc.*

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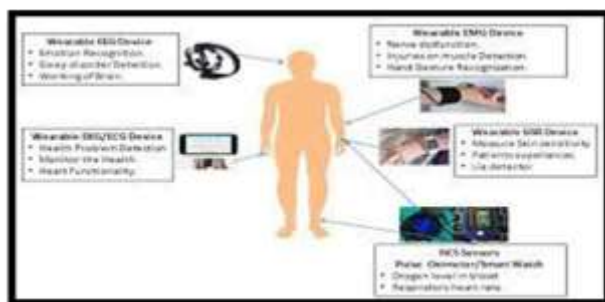
I. INTRODUCTIONS

Figure 1: Concept of biochemical sensor
(Source: Influenced by 1)

In the medical field, biochemical sensors make evolutionary changes where a combination n of artificial intelligence in the sensor offers more effective diagnostic treatment of the patients. In this context, the biochemical sensor has been used to diagnose brain tumours where AI gives an effective to boost the surveillance of the tumour in positive ways [1]. In this scenario, using different types of algorithms the AI will help to collect the diagnostics data automatically and offers effective results which brings effective treatment. In terms of surveillance of the tumour condition, the biochemical sensor and the ai give real-time information which helps to get better outcomes for the patients Figure 1.

II. OBJECTIVES

The objective of this study is as follows:

- To understand the combination of AI with biochemical sensors in the surveillance of brain tumours
- To measure the effectiveness of the AI in the biochemical sensor for brain tumour surveillance aspects
- To understand the benefits as well as disadvantages of the biochemical sensor for the tour diagnostics aspect where AI combined
- To Understand the challenges faced by the biochemical sensor during surveillance of the brain tumour

III. METHODOLOGY

In terms of methodology, different types of algorithms have been used to get the real-time data and all the data are related to the condition of the brain tumour. In that case, the biochemical sensor collected all the data and provides it to the different types of machinery where AI tools use different types of algorithms that help to analyse the state of the brain tumour in positive ways [2].

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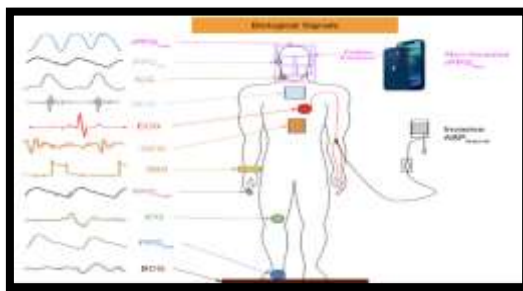## IV. CONCEPT OF THE BIOCHEMICAL SENSOR FOR BRAIN TUMOURS SURVEILLANCE

Figure 2: Understanding the monitoring aspects through AI with biochemical sensors
(Source: influenced by 4)

In terms of surveillance of the brain tumour condition, different types of biochemical sensors detect activities of the cerebrospinal fluid. In this scenario, this fluid offers an indication of the brain tumour in human beings in Figure 2. On the other hand, through the help of these sensitive sensors, small changes can be identified which helps to understand the condition of the tumour which takes in the brain [3]. In that case, these types of sensors clone all the data and transferred it to the AI for analysis where different types of algorithms offer identification of different activities of cerebrospinal fluid and offer the relative condition of the tumour. In terms of revolutionary changes combination of the AI with the biochemical sensor in the medical aspects improves the diagnostic aspects that enhance the procedure of the treatment [4].

V. "IMPORTANCE OF ARTIFICIAL INTELLIGENCE IN BIOCHEMICAL SENSORS FOR BRAIN TUMOURS SURVEILLANCE

Important factors	Descriptions
Monitoring	A combination of AI and sensors gives real-time monitoring
Detection early	Biochemical sensors and AI give early detention for the Brain tumour [5]
Data analysis	All the collected data by the sensor, AI did an analysis
Effective treatment	as per the patient condition, AI gives the treatment
Improvement of accuracy	monitoring as well as diagnostic aspects is accurate and helps in treatment aspects

Table 1: Important factors that help in monitoring the brain tumour through the biochemical sensor"

As per the above table, in the monitoring aspect of the tumour, different types of biochemical sensors offer effective monitoring aspects as well as earlier detections, effective data analysis method and personalized treatment for better outcomes [6]. It is clearly given the important factors in Table 1.

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VI. ADVANTAGES OF THE USE OF THE BIOCHEMICAL SENIOR FOR THE BRAIN TUMOUR SURVEILLANCE

In terms of the advantages of the use of biochemical sensors in the monitoring of brain tumours of human beings where AI increases the effectiveness [7]. In that case, accuracy in the tumour detection takes place when the sensor sends the real-time data to the AI and analyses the condition of the tumour. On the other hand, this type of sensor did not offer any radiation as a result, there are no risks taking place [8]. This type of monitoring is cost-effective and offers effective outcomes for the patients. During collecting data where understanding the activities of cerebrospinal fluid take place in which patients filled convertible instead of uncomfortable [9].

"Factors	Benefits
Enhancement of effectiveness	AI and sensors offer real-time information about the tumour
No risk	in this diagnostic treatment, this encore did offer any types of radiation which help in the effective treatment
Cost-effective	This type of diagnostic of brain tumour is cost-effective as well as gives accurate results [10]
Measure the activities of Cerebrospinal fluid	This type of monitoring takes place by doing Cerebrospinal fluid measurement

Table 2: Advantages of the biochemical sensors in the brain tumour surveillance"

VII.DISADVANTAGES OF THE USE OF THE BIOCHEMICAL SENIOR FOR THE BRAIN TUMOUR SURVEILLANCE

In terms of disadvantages, there are several disadvantages has been taken place. In that case, these types of diagnostic need time-to-time testing that can be increased the cost of the brain tumour monitoring aspects. On the other hand, the availability of medical expertise is one of the major issues faced by patients where increasing the unethical aspect that is related to the use of normal people as medical expertise is one of the disadvantages of this aspect [11]. In this scenario, due to the technical issues, this treatment can produce negative as well as inaccurate results, which can create negative impacts on the diagnostics aspects where a delay in the treatment for the patients has taken place. Due to frequent testing, the price of surveillance of brain tumours for human beings becomes expensive which creates negative impacts on the outcomes. Also some factors are given in Table 2.

IX. RESULTS AND DISCUSSIONS

Increasing the technical issues create negative impacts on the monitoring of brain tumour where increasing the cost of treatment and the availability of medical expertise takes place. In this section, we analysed the factors of AI percentage for the below Table 3 and Table 4.Furthermore the graphical represents for the diagrams at Figure 3 to figure 5, factor of AI%.

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S.No	Important factors	AI %
1	Monitoring	75
2	Detection early	90
3	Data analysis	85
4	Effective treatment	80
5	Improvement of accuracy	90

Table 3 The important factors of AI in brain tumour

S.No	Factors	AI %
1	Enhancement of effectiveness	90
2	No risk	85
3	Cost-effective	80
4	Measure the activities of Cerebrospinal fluid	75

Table 4 The factors of AI in brain tumour

Figure 3: Understanding the Important factors through AI with biochemical sensors

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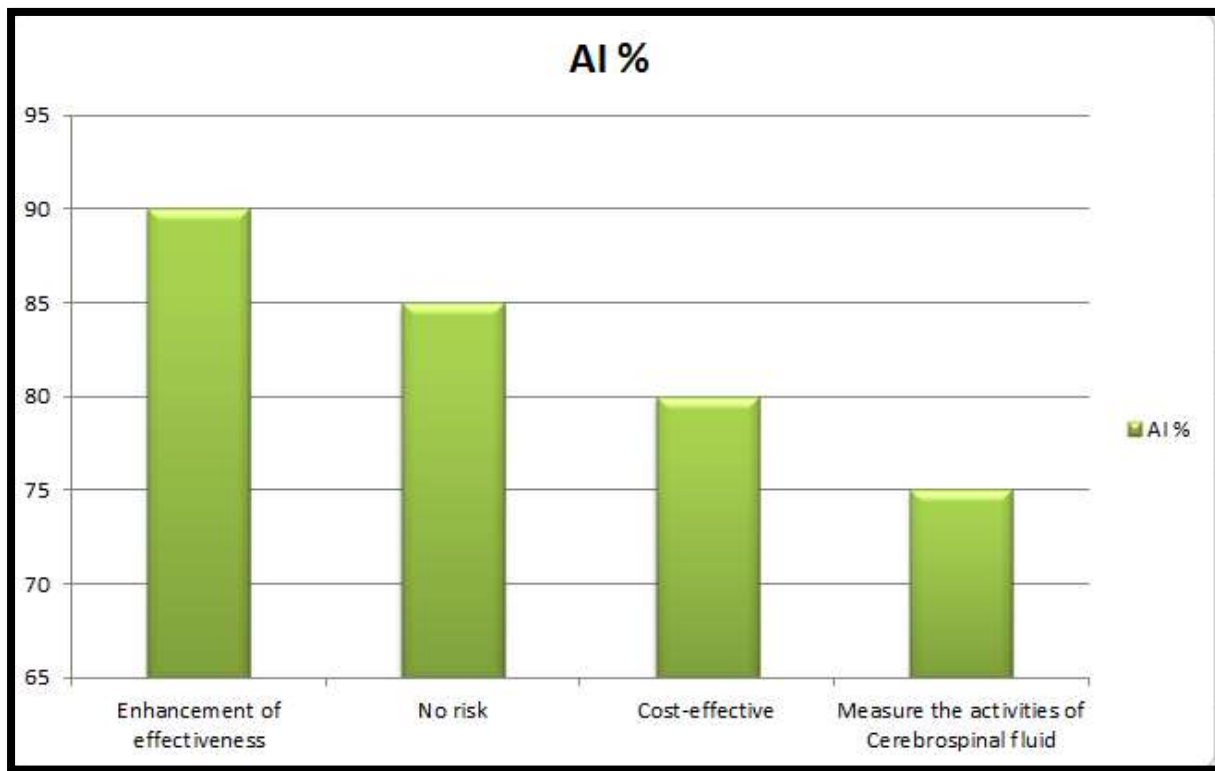Eur. Chem. Bull. 2023, 12(Special Issue 4), 4300-4307

Figure 4: Understanding the factors through AI with biochemical sensors
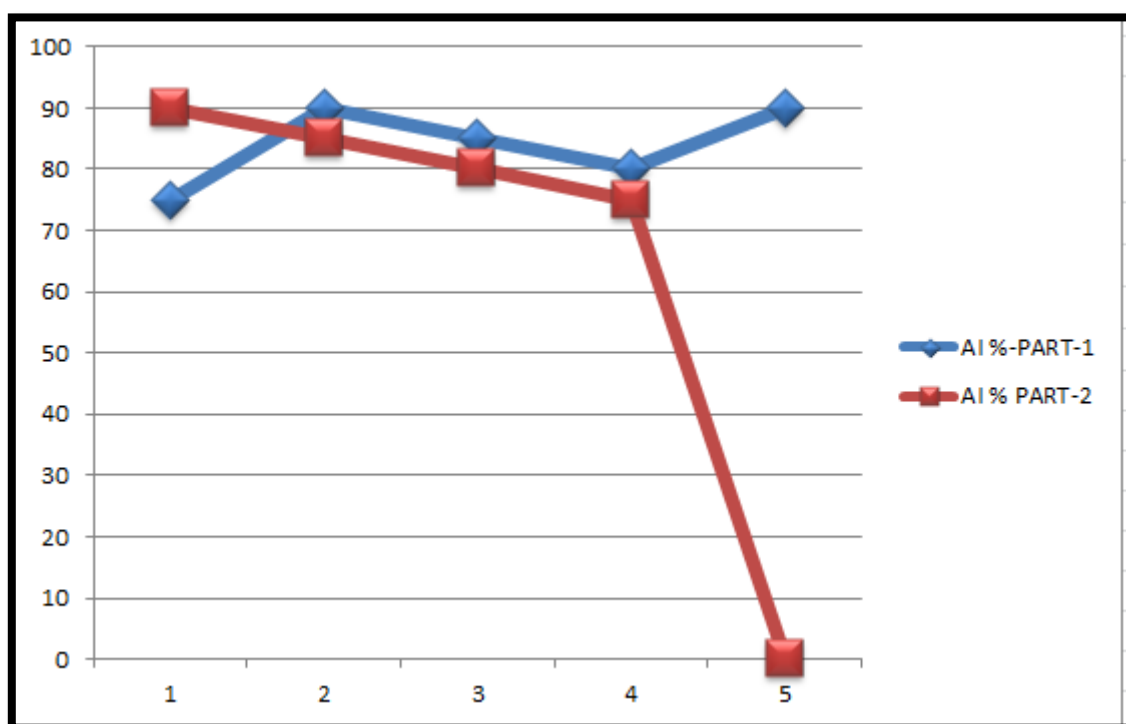

Figure 5: Understanding the both factors comparative results through AI with biochemical sensors

X. CONCLUSION

In the end, it can be concluded that biochemical sensors in the medical treatment aspects offer an effective revolutionary change that brings effeteness in the treatment aspects. In this

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context, understanding the activities of Cerebrospinal fluid help to understand the conditions of the brain tumour where biochemical sensors offer real-time information which is analysed by the AI and provided effective as well as personalized treatment for the patients. Finally we understanding the both factors comparative results through AI with biochemical sensors

References

[1] Govindan, B., Sabri, M.A., Hai, A., Banat, F. and Haija, M.A., 2023. A Review of Advanced Multifunctional Magnetic Nanostructures for Cancer Diagnosis and Therapy Integrated into an Artificial Intelligence Approach. *Pharmaceutics*, *15*(3), p.868. Retrieved on: 15th April 2023, from: https://www.mdpi.com/1999-4923/15/3/868/pdf

[2] Arabahmadi, M., Farahbakhsh, R. and Rezazadeh, J., 2022. Deep learning for smart Healthcare—A survey on brain tumor detection from medical imaging. *Sensors*, *22*(5), p.1960. Retrieved on: 15th April 2023, from: https://www.mdpi.com/1424-8220/22/5/1960/pdf

[3] Masud, M., Sikder, N., Nahid, A.A., Bairagi, A.K. and AlZain, M.A., 2021. A machine learning approach to diagnosing lung and colon cancer using a deep learning-based classification framework. *Sensors*, *21*(3), p.748. Retrieved on: 15th April 2023, from: https://www.mdpi.com/1424-8220/21/3/748/pdf

[4] Wani, S.U.D., Khan, N.A., Thakur, G., Gautam, S.P., Ali, M., Alam, P., Alshehri, S., Ghoneim, M.M. and Shakeel, F., 2022, March. Utilization of artificial intelligence in disease prevention: Diagnosis, treatment, and implications for the healthcare workforce. In *Healthcare* (Vol. 10, No. 4, p. 608). MDPI. Retrieved on: 15th April 2023, from: https://www.mdpi.com/2227-9032/10/4/608/pdf

[5] Keshri, S., Kumar, R., Kumar, D., Singhal, T., Giri, S., Sharma, I. and Vatsha, P., 2022. Insights Of Artificial Intelligence In Brain Disorder With Evidence Of Opportunity And Future Challenges. *Journal of Pharmaceutical Negative Results*, pp.10853-10867. Retrieved on: 15th April 2023, from: https://pnrjournal.com/index.php/home/article/download/8957/12238

[6] Broza, Y.Y. and Haick, H., 2022. Biodiagnostics in an era of global pandemics—From biosensing materials to data management. *View*, *3*(2), p.20200164. Retrieved on: 15th April 2023, from: https://onlinelibrary.wiley.com/doi/pdfdirect/10.1002/VIW.20200164

[7] Singh, A.V., Chandrasekar, V., Janapareddy, P., Mathews, D.E., Laux, P., Luch, A., Yang, Y., Garcia-Canibano, B., Balakrishnan, S., Abinahed, J. and Al Ansari, A., 2021. Emerging application of nanorobotics and artificial intelligence to cross the BBB: advances in design, controlled maneuvering, and targeting of the barriers. *ACS chemical neuroscience*, *12*(11), pp.1835-1853. Retrieved on: 15th April 2023, from: https://pubs.acs.org/doi/pdf/10.1021/acschemneuro.1c00087

[8] Becker, B.V., Kaatsch, H.L., Nestler, K., Jakobi, J., Schäfer, B., Hantke, T., Brockmann, M.A., Waldeck, S., Port, M. and Ullmann, R., 2022. Impact of medical imaging on the epigenome–low-dose exposure in the course of computed tomography does not induce detectable changes of DNA-methylation profiles in peripheral blood cells. *International Journal of Radiation Biology*, *98*(5), pp.980-985. Retrieved on: 15th April 2023, from: https://www.tandfonline.com/doi/pdf/10.1080/09553002.2021.2004329

[9] Connell, M., 2019. *The Work of Nurses in the Fever Unit at the Ontario Hospital Toronto: A Qualitative Descriptive Case Study* (Doctoral dissertation, Université d'Ottawa/University of Ottawa). Retrieved on: 15th April 2023, from: https://ruor.uottawa.ca/bitstream/10393/39513/5/Connell_Mary_2019_thesis.pdf

[10] Hanif, S., Muhammad, P., Niu, Z., Ismail, M., Morsch, M., Zhang, X., Li, M. and Shi, B., 2021. Nanotechnology- based strategies for early diagnosis of central nervous system disorders. *Advanced NanoBiomed Research*, *1*(10), p.2100008. Retrieved on: 15th April 2023, from:

https://scholar.google.com/scholar?output=instlink&q=info:aRE2xZE_cGoJ:scholar.google.com/&hl=en&as_sdt=0,5&as_ylo=2019&scillfp=11461749205879873690&oi=lle

[11] Chengoden, R., Victor, N., Huynh-The, T., Yenduri, G., Jhaveri, R.H., Alazab, M., Bhattacharya, S., Hegde, P., Maddikunta, P.K.R. and Gadekallu, T.R., 2023. Metaverse for Healthcare: A Survey on Potential Applications, Challenges and Future Directions. *IEEE Access*. Retrieved on: 15th April 2023, from: https://ieeexplore.ieee.org/iel7/6287639/6514899/10034994.pdf

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