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Editorial

Big data and artificial intelligence

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We are living in the era of digitisation which is casting an unimaginable impact on every aspect of our lives and the medical field is no exception. This has resulted in the emergence of huge data. The term 'Big Data' was coined in the 1990s.[1] It describes a massive availability of data on any subject which is colossal in quantity and diverse in nature. This was possible due to the availability of superfast computers with extensive data storage capability. Since the invention of computers, people started to think of 'Artificial Intelligence' as early as 1956, when the 1st academic conference on 'Artificial Intelligence' was organised. 'Artificial Intelligence' has penetrated in our day to day lives without us even realising that we are using 'Artificial Intelligence' so frequently. Some of the examples are Google Maps, driver free car drive, e-commerce recommendation systems, automated marketing, etc. 'Artificial Intelligence' has big scope for future, but it has its own pros and cons.[2] Error free processing, round the clock availability, help in repetitive jobs, right decision-making and digital assistance are the advantages whereas high cost of creation, increase in unemployment, lacking creativity, lacking improvement and no human replication are the major disadvantages.

The interaction between 'Big Data' and 'Artificial Intelligence' has resulted in one of the greatest steps forward in medical research in the current century. The increasing popularity of electronic health records and the storage of huge medical imaging data became revolutionary drivers of medical research. It started solving challenging medical research questions involving multiomics which resulted in the concept of personalised medicine. The widely available non-invasive ophthalmic imaging coupled with machine learning and deep learning brought ophthalmology in the forefront of 'Artificial Intelligence'.

The intelligent research in sight Registry initiated by the American Academy of Ophthalmology is the largest database in the world. The interplay between 'Big Data' and 'Artificial Intelligence' can generate new hypotheses and a better insight in the mechanisms of any disease. No one would have imagined forecasting future field defects from a single baseline visual field or creating optical coherence tomography angiography from structural optical coherence tomographic images alone. The deep learning algorithms started appearing for detecting certain diseases at a very early stage.

In the present scenario, the researchers are driven by observation to hypotheses approach, whereas 'Big Data' and 'Artificial Intelligence' are data driven and allow discoveries outside the boundaries of traditional research methodology. Some examples are identification of imaging features, subtle associations and novel biomarkers due to availability of multiomics data sets. There are many challenges ahead, which include standardisation of data sets, ethical issues, data privacy, data sharing processes and transferring research findings to clinical use.

The picture is not as rosy as it seems due to various limitations, the biggest being validation of 'Big Data' and 'Artificial Intelligence' study results in independent study cohorts. Due to the availability of large data, statistical significance may not result in clinical significance as well because we know that the large data set will show statistical significance even with a small difference. One has to understand that the data which has been used to develop 'Artificial Intelligence' algorithms is pooled from innumerable health records which may not be valid uniformly. In the medical field, 'Artificial Intelligence' can be utilised under the four major headings:

1. Diagnostics
2. Drug development
3. Personalised treatment and
4. Gene editing.

I personally foresee a wonderful opportunity for these for the International Society of Manual Small Incision Cataract Surgeons (ISMSICS). There is a big chunk of ophthalmic

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surgeons who are performing manual small incision cataract surgery (MSICS), but there is a lack of published data pronouncing that MSICS is in no way an inferior cataract surgery. ISMSICS should start a registry for studying various outcomes of MISCS. This will generate a big data, which will provide answers to many unanswered questions related to MSICS. This will help to fill the gap and give due importance to MSICS.

'Big Data' and 'Artificial Intelligence' are rapidly evolving fields and the future appears to be bright. Thirty years down the line, we are sure to see an unimaginable change in the field of medicine. However, I have no definitive answer at present, to the question 'Will 'Artificial Intelligence' replace the physician?'

REFERENCES

1. Lee CS, Brandt JD, Lee AY. Big data and artificial intelligence in ophthalmology: Where are we now? Ophthalmol Sci 2021;1:100036.
2. Pros and Cons of Artificial Intelligence. Available from: https://intellipaat.com/blog/pros-and-cons-of-ai [Last accessed on 2023 May 27].

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