Medical providers should return the medical data ownership to the patient – a blockchain ledger solution. Opinion.

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ABSTRACT

Objective: Patients who paid for data generation, either privately or by public insurance or taxation systems, don't keep and don't have easy access to their health records. Furthermore, centralized databases that govern Big Data of health records are vulnerable to hostile breaches. Therefore, the current practice of medical data accumulation and sharing can potentially interfere with the fundamental personal rights of ownership, even endanger patients' health on one side, and provide uncompensated profit to third parties.

Material and Methods: The technical solution to this inherent problem might be storing personal medical data on the blockchain platform.

Conclusion: This method can decentralize the data accumulation, provide a high level of security of the collected data, and immutability of the stored data.

Keywords: blockchain; Big Data; medical records; patient rights; bioethical issues

INTRODUCTION

Most of the current medical records are kept on digital platforms owned by the medical providers. This data is generated following patients' evaluation and treatment and financed by direct payments or private or governmental insurance programs. Generally, the patients provide private and governmental funding sources directly or through taxation. Therefore the situation exists when the patients who paid for the generation of data regarding their health don't keep and don't have easy access to their records. Furthermore, the crucial data exchange among medical providers is not always readily available. Additionally, the administrator of the database can manipulate the data. The centralized databases are vulnerable to hostile breaches. Thus, the current medical databases endanger their real owners, i.e., patients, because of insufficient availability and security. This is not a theoretical but rather a real threat, supported by the recent hacking of data in the US hospitals, UK NHS databases, and the recent attack on the medical records database in Hillel Yafe Hospital in Israel. Moreover, the centralized accumulation of the medical records by the medical providers generates Big Data accumulation. This financial asset can be traded and provide economic benefit for the institutions without compensation and approval by the patients who are the actual owners of these assets (Figure 1).

Therefore, the current practice of medical data accumulation and sharing can potentially interfere with the fundamental personal rights of ownership, even endanger patients' health on one side, and provide uncompensated profit to third parties. Recently this issue was further emphasized by the concern on the attempts of commercial third parties to mine clinical data from medical providers' databases.

MATERIAL and METHODS (Possible solution)

The solution to this inherent problem should be based on the following principles [1,2,3]:

- Decentralization of the data accumulation
- High level of security of the collected data
- Immutability of the stored data

These factors are the blockchain platforms' data storage and transfer characteristics. By utilizing this data storage method, sophisticated encryption should achieve security. If the keys to the data are available only to the patients, the control of Big Data by the medical institutions will be omitted. The miscommunication between health providers will become irrelevant since all the information will be solely in the patient's hands and can be used only for their own medical and financial benefit (Figure 2).
**DISCUSSION**

Blockchain technology is relatively new and mainly used for financial transactions. Its implementation for health care data storage should overcome several technical obstacles and be appropriately regulated.

On the technical side, the main issue that should be resolved is encrypting a high volume of data, including imaging and high-speed transfer of the data on the blockchain platform.

The blockchain storage of medical records should be thoroughly regulated. The policymakers should consider its theoretical advantage for security and personal ownership.

**CONCLUSION**

Storing patient records on a blockchain platform can decentralize the data accumulation, provide a high level of security of the collected data, and immutability of the stored data.

**Author Contributions:** ER, NR: Study design, Literature review, Data collection and/or processing, Analysis and/or interpretation, NR: Writing, Revision

**Acknowledgments:** None

**Conflict of interest:** The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. This research did not receive a specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

**Ethical approval:** The study was conducted according to the guidelines of the Declaration of Helsinki and approved by Local Ethical Committee. All procedures performed in studies with human participants met the ethical standards of the Institutional Research Commission and the 1964 Declaration of Helsinki and its subsequent amendments or comparable ethical standards.

**REFERENCES**

