

Brief report

Change in variant of SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2) of COVID-19 (Coronavirus disease 2019) in our genetic laboratory from April 26th to August 31st in 2021.

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Summary: We examined the change of a variant of concern (VOC) of SARS-CoV-2 (coronavirus) by Reverse Transcription Polymerase Chain Reaction (RT-PCR) in 23 cases diagnosed COVID-19 in our hospital laboratory from 2021/4/26 to 8/1. The predominant VOC changed sequentially from Wuhan type, α type, β/γ types, and δ type, corresponding to our country change.

Key words: variant of SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2), COVID-19 (Coronavirus disease 2019), 2021

Material and method

VOC of coronavirus was studied in nasopharyngeal samples of 23 cases diagnosed COVID-19 in our hospital laboratory from 2021/4/26 to 8/31.

Measuring instrument was AriaMx Realtime PCR system (Agilent, As one, Osaka), and VOC reagents consisted of the followings: 1. Takara Primer/Probe N501Y (SARS-CoV-2) (RC344A) for α , β , γ subtypes, 2. Takara Primer/Probe E484K (SARS-CoV-2) (RC345A) for β , γ subtypes, 3. Takara Primer/Probe L452R (SARS-CoV-2) (RC346A) for δ subtype, And TaqMan probe for RT-PCR was Takara SARS-CoV-2 Direct Detection RT-qPCR Kit (RC300A) for RT-qPCR (Takara Bio, Kusatsu),

Results

Each variant was detected in our country at 3 or 6 months after first confirmation in the world, overwhelmed Wuhan type and preceding ones in turns.

Coronavirus subtype α became predominant in April and May, subtype β/γ in May and June, and, furthermore, subtype γ , in July and August. This change of the subtype accorded with the domestic change.

Acknowledgements

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Postscript: On November 24th in 2021, the omicron mutant of SARS-CoV-2 has been identified in South Africa and spread to Japan after December in 2021, forming the sixth wave of epidemic infection. From December 1st in 2021 to February 10th in 2022 at our laboratory, nasopharyngeal scraping samples of 11 cases positive for SARS-CoV-2 PCR test were examined for the omicron mutant strain. The identification of omicron mutant was studied by PCR analysis with two reagents from Takara's omicron mutation primer/probe G339D and E484A. The omicron mutation was found in 10 cases (91%), consisted of 8 cases positive for both G339D and E484A, 1 case positive for only G339D, and 1 case positive for only E484A. One case (9%) was the delta mutant strain, positive for L452R reagent. The mutational change from the alpha/beta types to the delta type has caused the fifth epidemic wave in Japan and, furthermore, the recent sixth wave may originate from the omicron type.

References

1. NHK. New coronavirus. <https://www3.nhk.or.jp/news/special/coronavirus/entire/>
2. Takara SARS-CoV-2 Direct Detection Kit. https://catalog.takara-bio.co.jp/product/basic_info.php?unitid=U100009449

和文抄録

短報

2021年4月26日より8月31日までの当施設検査室依頼PCR検査に関して、新型コロナウイルス感染症のウイルス亜型の変異に関する検討

Change in variant of SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2) of COVID-19 (Coronavirus disease 2019) in our genetic laboratory from April 26th to August 31th in 2021.

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2021/4/26より8/31までにJA新潟県厚生連長岡中央総合病院遺伝子検査室に提出された鼻咽頭擦過検体によるCOVID-19のSARS-CoV-2 (coronavirus) by Reverse Transcription Polymerase Chain Reaction (RT-PCR) 遺伝子診断陽性例23症例に関して、遺伝子変異型について検討した。変異の優位亜型は武漢型→ α 型→ β/γ 型→ δ 型と変遷し、国内での流行に一致した。

追記：2021年11月24日に、南アフリカ共和国において確認されたコロナウイルスのオミクロン変異株が、2021年12月以降に日本に波及し、第6波の流行となった。2021年12月1日より2022年2月10までに、当院検

査室でコロナ感染陽性と診断された11症例の鼻咽頭擦過検体PCR検査により、オミクロン変異株を検討した。オミクロン変異株罹患の同定は、タカラ社のオミクロン変異 primer/probe G339DとE484Aの試薬を使用した。オミクロン陽性例は10例(91%)で、8例がG339DとE484A両方に陽性で、1例はG339Dのみ陽性、1例はE484Aのみ陽性であった。オミクロン陰性の1例はデルタ変異株(同社L452R変異試薬陽性)であった。前編第5波でデルタ株が優位に変遷したことを説明したが、直近第6波においてオミクロン株が優位であることが確認された。

キーワード：新型コロナウイルス、変異型、懸念される変異株、変異型の変遷、 α 型、 β/γ 型、 δ 型、逆転写ポリメラーゼ連鎖反応法

Fig 1. variant of corona virus (2021/4/26-8/31)

month/day	N501Y α, β, γ	E484K β, γ	L452R δ
4/26			
4/26			
4/28		●	
5/6	●		
5/7	●		
5/10	●		
5/11	●		
5/11			
5/12		●	
5/13	●		
5/14			
5/19	●		
5/24	●		
5/25		●	
5/28		●	
5/31		●	
6/2			
6/3		●	
6/7		●	
7/5			●
8/4			●
8/6			●
8/10			●

Fig 2. The change of epidemic phases and the variant of the coronavirus in Japan

year	2019	2020				2021				
month	12	4	8	12	3	4	5	6	7	8
epidemic phase		I	II	III		IV				V
varint, prevalence %	α			+	3%	61%	76%	83%		
in Tokyo	δ					+	+	30%	50%	90%