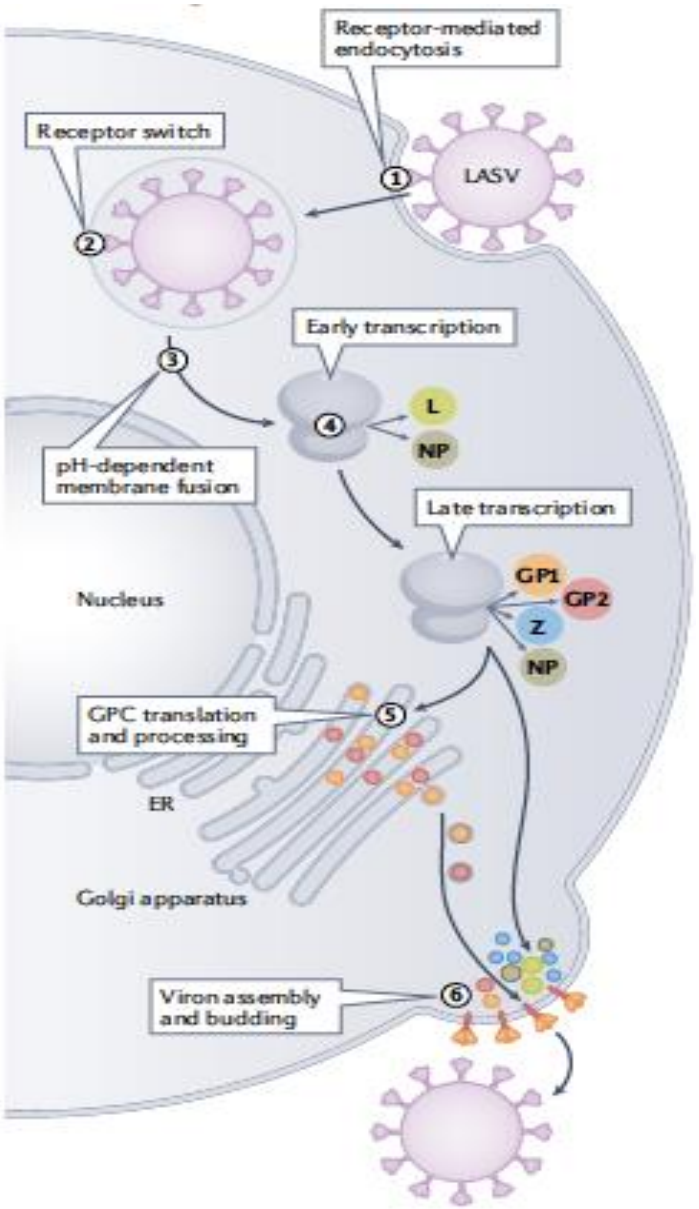
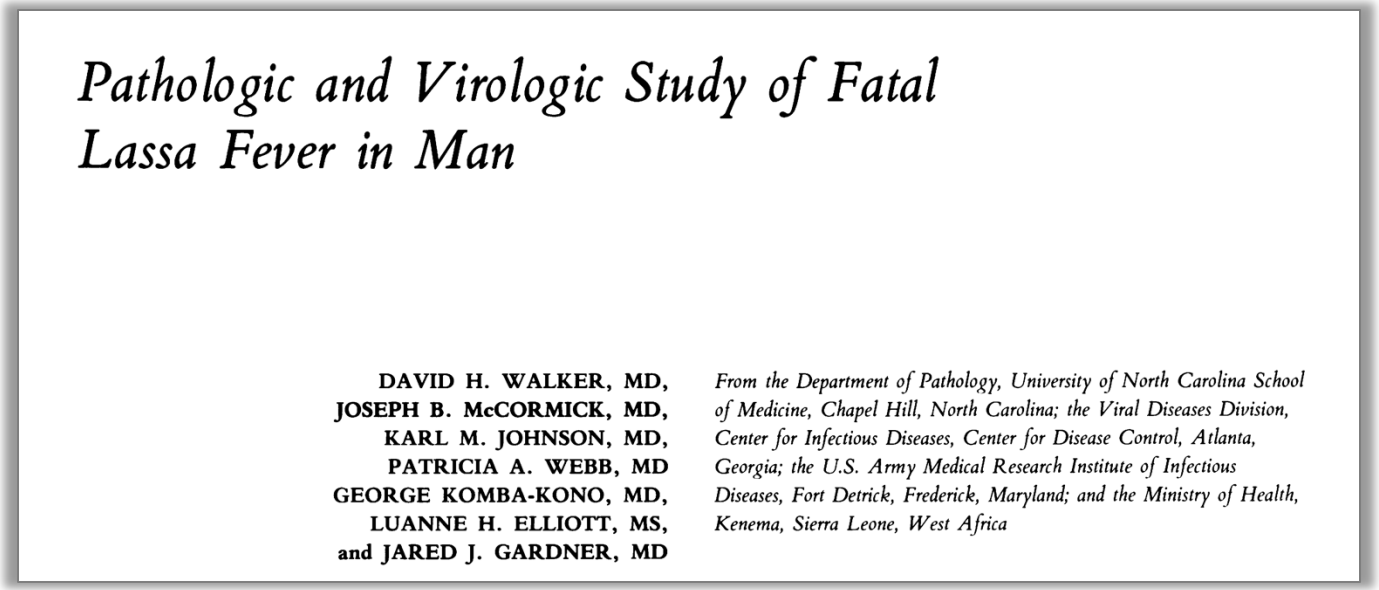
AKI in Lassa fever

Lassa virus replication



Lassa virus and kidney



Pathologic and Virologic Study of Fatal Lassa Fever in Man

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Patients with Lassa fever in 1976 – 1980 in Sierra Leone:

Complete postmortem examination of 6 patients
Tissues from 7 fetuses from women infected with Lassa virus
Postmortem biopsies from additional 18 patients

Am J Pathol 1982, 107:349–356

Lassa virus and kidney

Table 1—Organ Viral Titers* and Selected Clinical Laboratory Data

Case	Blood	Liver	Spleen	Lung	Kidney	Adrenal	Others	AST†	ALT‡	CPK§	BUN‖	Amy-lase¶
1	6.5	0	–	–	–	–	–	1124	131	1604	15	270
2	≥5.0	0	0	–	3.5	–	Pl-6.5	2688	305	208	67	30
3	6.1	–	–	–	–	–	–	–	–	–	–	–
4	≥2.9	–	–	–	–	–	–	965	–	–	–	–
5	5.6	2.5	–	–	4.6	–	BM-4.6	3966	1455	4568	76	–
6	5.5	6.0	5.5	6.5	6.0	4.0	MG-7.0, 0-6.0, H-5.5, LN-4.5, Pa-4.0, SG-3.5	–	–	–	–	–
9	5.1	0	–	–	–	–	–	2336	299	297	66	1120
10	7.0	6.5	3.5	–	6.5	–	–	–	441	–	–	–
11	6.6	–	–	–	–	–	–	1641	183	611	41	68
12	5.6	–	–	–	–	–	Pl-4.6	8	258	305	54	–
13	–	–	–	–	–	–	–	56	37	45	8	38
14	6.1	9.0	9.0	9.0	7.0	–	H-6.5, B-4.5, Pa-4.5	–	–	–	–	–
15	8.1	8.5	7.0	6.5	6.5	6.5	Pl-8.0, Pa-6.5, H-6.0, B-5.5	–	–	–	–	–
16	0	0	–	–	4.5	–	–	–	–	–	–	–
17	4.6	–	–	–	–	–	–	687	94	>10,000	74	1325
20	5.1	6.5	–	–	–	–	–	–	–	–	–	–
Fetus 1	–	0	2.0	–	4.0	–	T-0	–	–	–	–	–
Fetus 2	–	0	0	–	0	–	H,Pa,T,Pl-0	–	–	–	–	–
Fetus 3	3.5	–	4.8	3.8	3.0	–	Pl-7.5	–	–	–	–	–

Am J Pathol 1982, 107:349–356

Lassa fever infection and AKI

The Risk of Severe Acute Kidney Injury Requiring Renal Replacement Therapy in Viral Hemorrhagic Fevers. A Review of Literature

Nehemias Guevara[1], Claudia Olano[2], Marlon Argueta[1], Sami Akram[3]

Literature search: PubMed search of the English literature from 1999 – 2019 using the term 'viral hemorrhagic fever' and 'renal failure' as the subject

74 publications, 78 patients

70% dengue and hantavirus infection

remainder: puumala virus, Ebola virus, Lassa fever infection

Overall mortality: 32.2%

International Journal of Clinical Medicine, 2022, 13, 147-156

Lassa fever infection and AKI

Pathophysiology of AKI in viral hemorrhagic fever

Multifactorial:

- ✓ Hypovolemia
- ✓ hemodynamic instability
- ✓ rhabdomyolysis
- ✓ nephrotoxicity
- ✓ direct cytopathic effects of the viral protein on the glomerular & tubular cells

Treatment:

supportive

no specific therapy

International Journal of Clinical Medicine, 2022, 13, 147-156

Lassa fever infection and AKI in children

Acute kidney injury and mortality in pediatric Lassa fever versus question of access to dialysis

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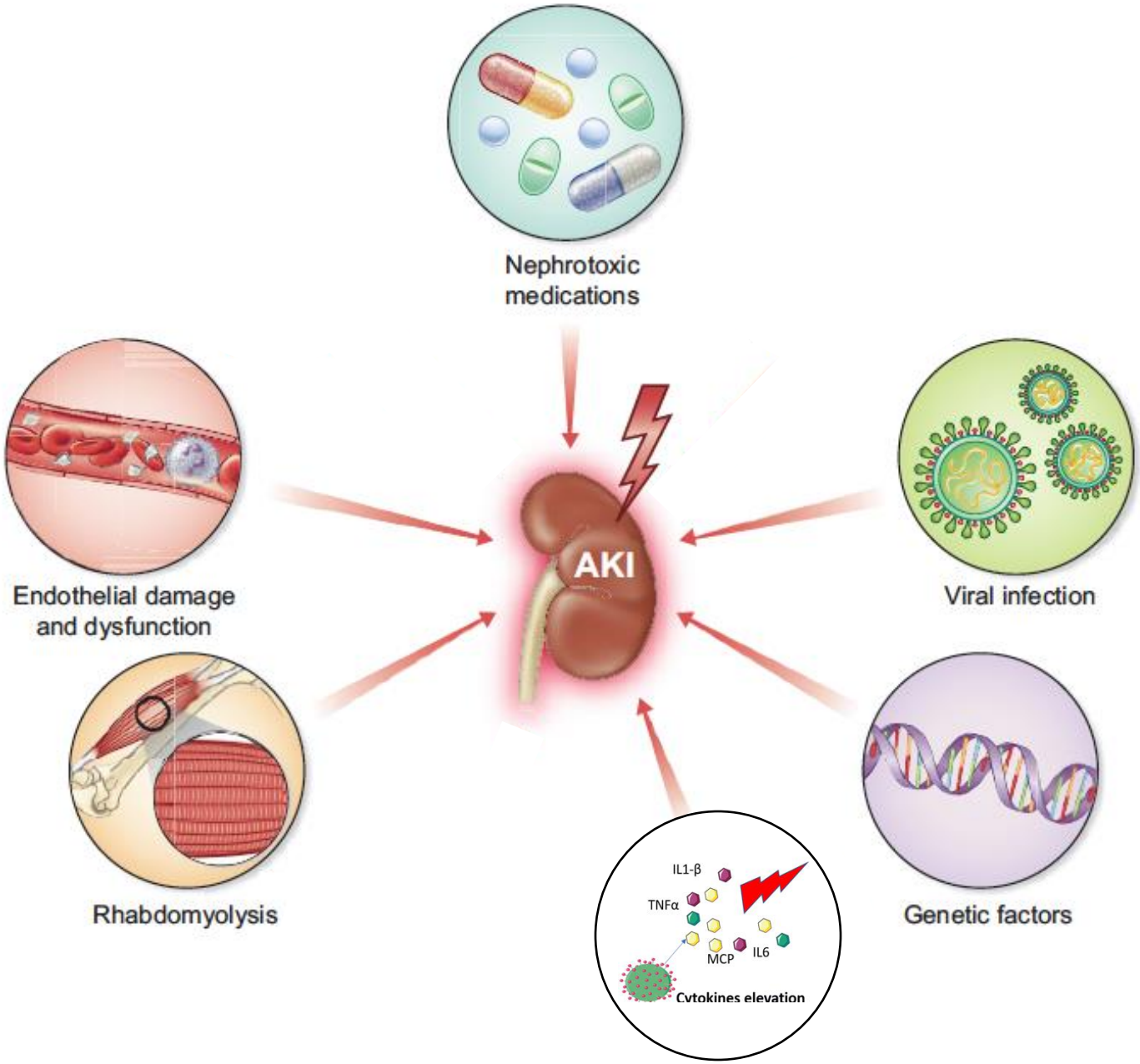
40 successive hospitalized children with confirmed Lassa fever between 2009 – 2017 in Nigeria

40% had AKI (mainly AKI stage 2 or 3)

Risk factors for AKI: abnormal bleeding
encephalopathy
hamaturia
elevated transaminases

International Journal of Infectious Diseases 103 (2021) 124–131

Lassa fever infection and risk of AKI



Lassa fever infection and AKI

Pathophysiology

Direct Viral Effects:
Kidney infection

Indirect Effects:
Hypovolemia
Systemic inflammation
Secondary infection
Rhabdomyolysis

Management Effects:
Nephrotoxins
Fluid management

Management

- ✓ Lassa fever associated AKI is often multi-factorial.
- ✓ The risk of AKI is higher in patients with more severe Lassa infection.
- ✓ There are no specific treatments for Lassa fever associated AKI.
- ✓ Standard of care to prevent and manage severe infections and multi-organ failure in critically ill patients is recommended.
- ✓ Fluid management is important.
- ✓ Exposure to nephrotoxins should be avoided if possible.
- ✓ The indications for RRT are not different than for other infection associated types of AKI